MARCH 23, 1935

# Railway Age

FOUNDED IN 1856

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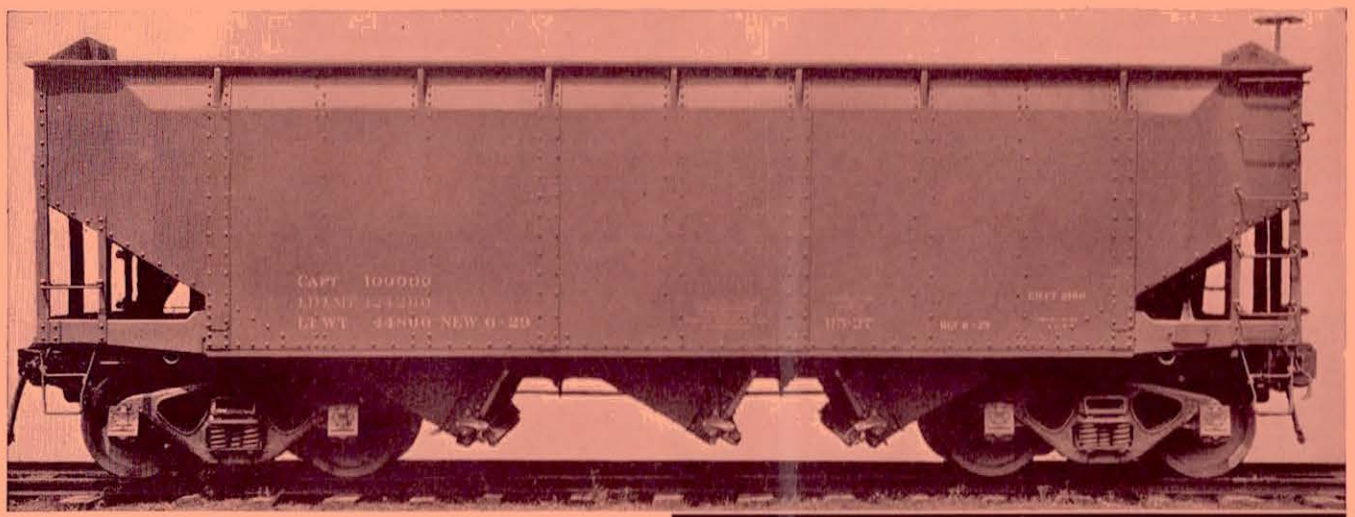

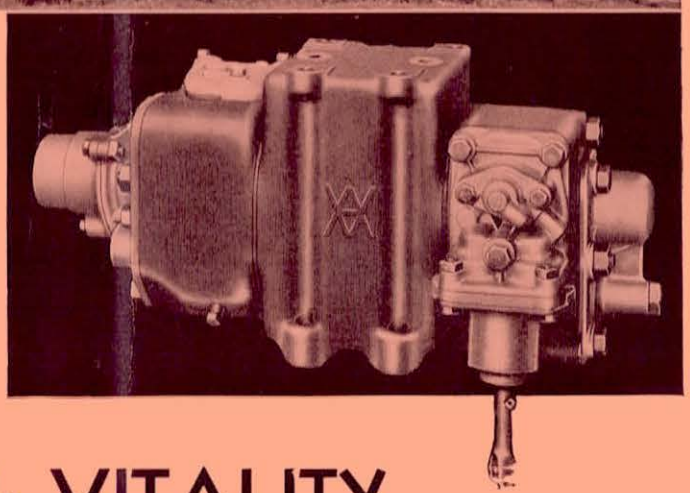

# General Reconditioning Adds YEARS— The "AB" Brake adds VITALITY

**WITH cars as with men—the value of life is not so much measured by the calendar as by the character. Not how long, but how well—that is the chief criterion. . . . Cars are reconditioned to give them a new lease on life—to extend their years of usefulness. But to enhance that life is more significant . . . . When the rebuilding programme includes installation of "AB" Brakes a marked increase in vitality is imparted to perpetuated life . . . . Every car so equipped will proportionately improve train operation . . . . . .**

**WESTINGHOUSE AIR BRAKE CO.**

General Office and Works Wilmerding, Penna.

(1282)

Published weekly by Simmons-Boardman Publishing Company, 1309 Noble Street, Philadelphia, Pa. Entered as second class matter, January 4, 1933, at the Post Office at Philadelphia, Pa., under the Act of March 3, 1879.

# COMPLETE LINES OF TRUCK TIRES FOR EVERY TRUCKING SERVICE AT LOWEST PRICES—GIVING LONG MILEAGE AND GREATEST ECONOMY

FIRESTONE pioneered the ship-by-truck movement in 1918, and ever since has consistently led in anticipating every requirement in the design and construction of truck and bus tires for every transportation condition. To accomplish this, Firestone has consistently followed the fundamental principle of its founder and active head, Harvey S. Firestone, "Always to find the way to build tires better than anyone else."

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By Gum-Dipping, every strand in every cord is soaked in liquid rubber, preventing friction—adding extra strength and long mileage. By having two extra layers of Gum-Dipped cords placed between the tread and cord body, it is practical to use a tread with higher, more rugged shoulders and a deeper non-skid with flatter contour.

All this provides more rubber on the road, giving longer wear, greater traction and quicker stops. These two extra construction features are patented and used only in Firestone Tires. Take a forward step in maintaining schedules and reducing operating costs. Call on the Firestone Service Store or Firestone Service Dealer today.

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Super traction tire for unimproved roads.

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For better braking control.

FIRESTONE FAN BELTS

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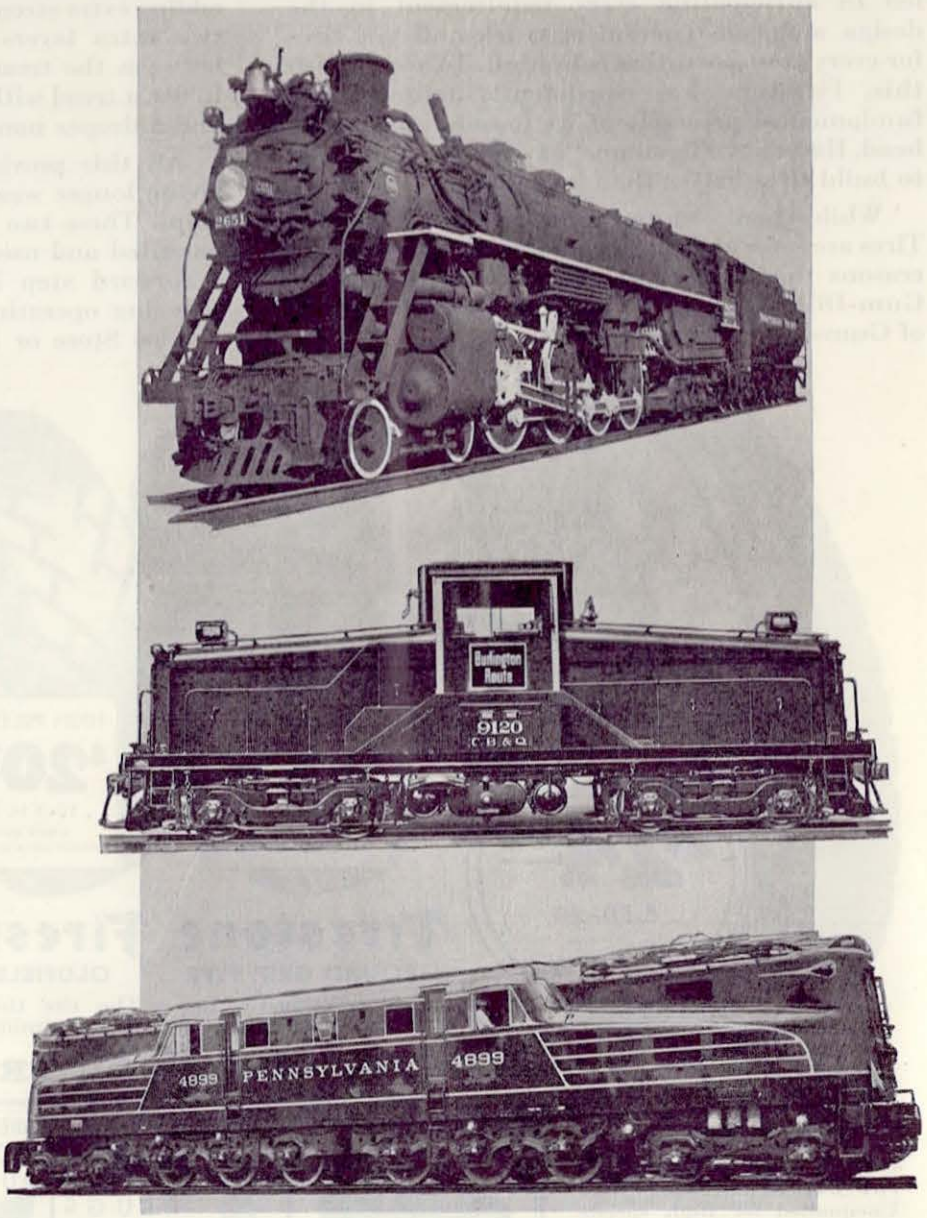
# MOTIVE POWER OF TODAY

*Steam*

*Internal Combustion*

*Electric*




**Regardless of type or size—**

*It takes Modern Locomotives to make money these days!*

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**PHILADELPHIA, PENNA.**

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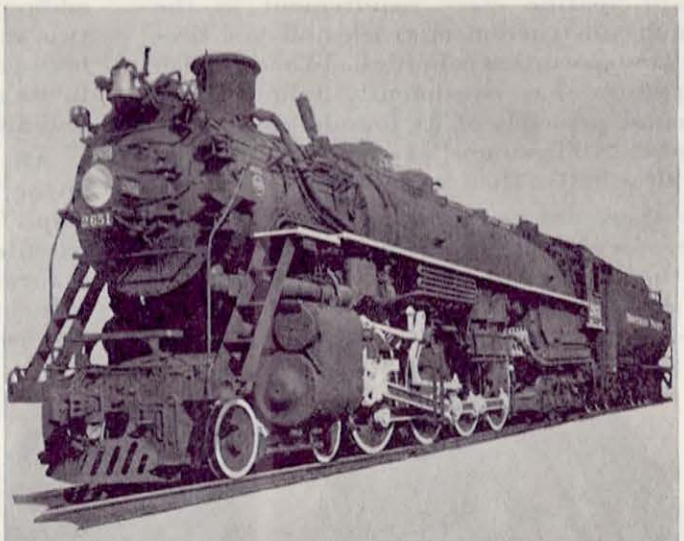
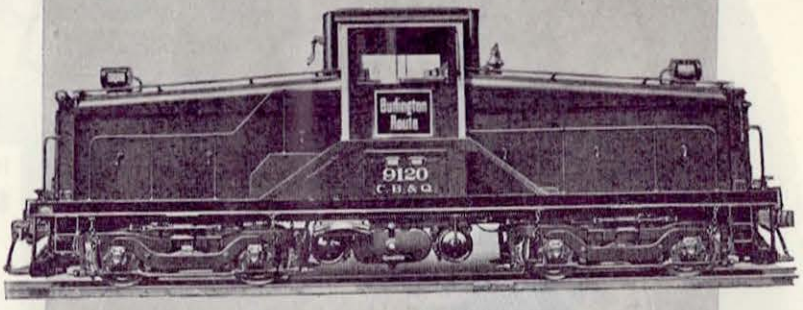


*Internal Combustion*




*Electric*

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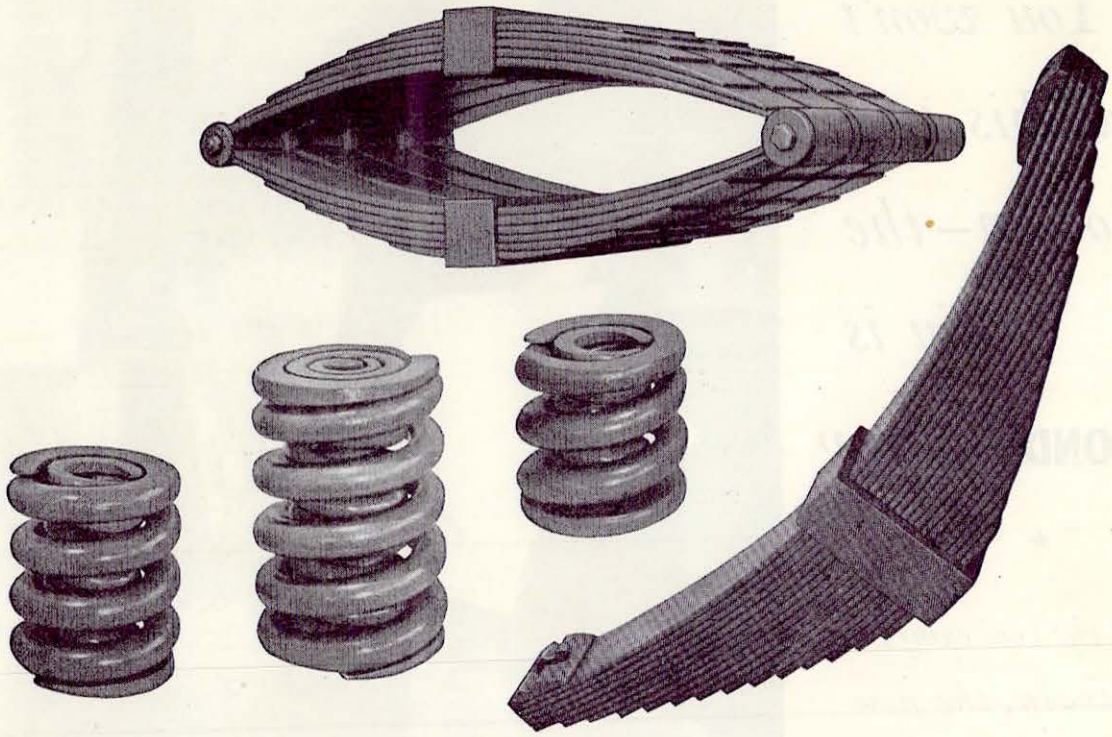
# Quality Springs



During a third of a century the American Steel Foundries has built up a reputation for the designing and manufacturing of springs for railway equipment and industrial purposes. Its plant is equipped with complete modern facilities for double heat treatment of springs to meet the new standard specifications.

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**AIR-CONDITIONED"**

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FREON

REG. U. S. PAT. OFF.

*a safe refrigerant*

KINETIC CHEMICALS, INC., TENTH & MARKET STREETS, WILMINGTON, DELAWARE

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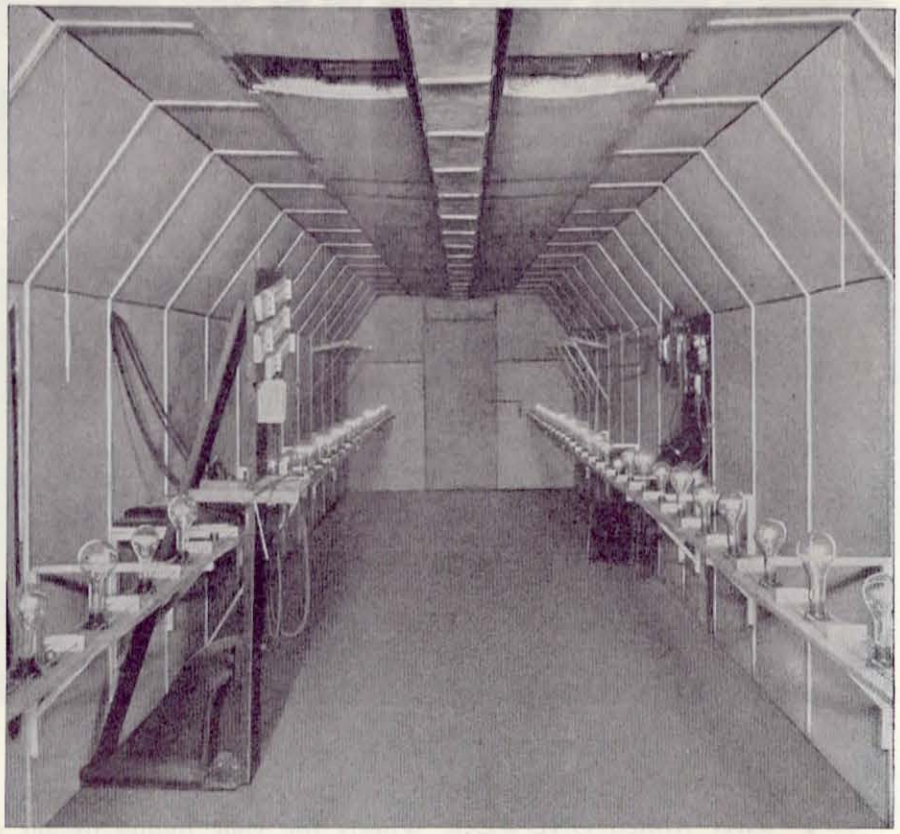
# IN AIR CONDITIONING

## *is proper air distribution*



THE DESIRED result in conditioning the air in railway cars is *passenger comfort.* To obtain this result it is necessary to develop a system of air distribution to fit each individual condition. Drafts or noticeable air currents must be eliminated . . . and this should be accomplished without reducing the cooling capacity of the system and without excessive power consumption.

Convinced of the great importance of air distribution as a definite factor in successful railway air conditioning, Sturtevant has designed and built the Railway Air Conditioning Development Laboratory shown in the photograph. It is the full size and length of a passenger car and is given over entirely to the working out of air distribution problems in cooperation with railroads. Actual operating conditions, with either ice or Freon, are obtainable, even to load conditions from minimum to maximum passenger capacity.

In this laboratory is found a definite solution to the air distribution problem of each railway air conditioning specification dealt with. Equipment to produce and a distribution system to meet temperature differentials from 5° to 35° are worked out and the operation scientifically proved and tested.

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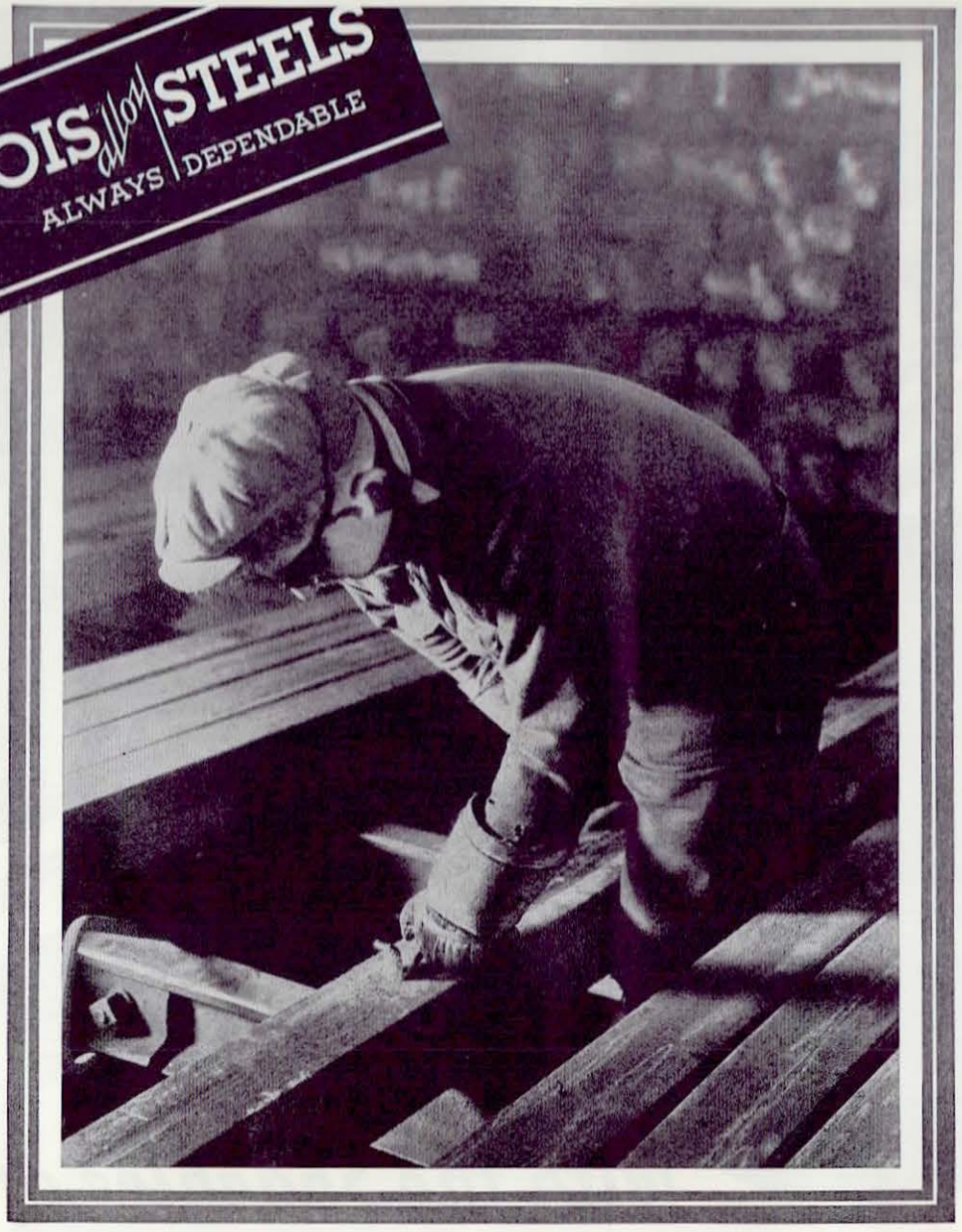


# HOW AN OUNCE CAN SAVE A TON

● It's only a tiny seam . . . no larger than an eyelash . . . but out it comes before this billet of Illinois Alloy Steel can start through the mill. Every seam, every surface imperfection or irregularity is chipped out of the billets; and every billet is double-checked before going to the re-heating furnace. Thus, a few ounces chipped from a billet here safeguards the quality of the finished bar stock rolled from that billet.

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★ GENUINE BENDIX-WESTINGHOUSE CONTROL IS NOW AVAILABLE FOR LIGHTER VEHICLES AT A COST UNPRECEDENTED IN AIR BRAKE HISTORY

## *Eastman Advocates Consolidation*

Federal Co-ordinator of Transportation Joseph B. Eastman, in his recent legislative report, advocated large scale consolidations of railroads along regional lines. Legislation providing governmental authority to compel unification is being sought.

# RAILROAD MERGERS

**By JOHN WILL CHAPMAN, B.S., M.C.S.**

***Member of Investment Staff, United States Trust Company of New York; Formerly Statistical and Security Analyst for Standard Statistics Company***

THIS timely new book deals with the causes, methods of effecting and results of railroad mergers. It is packed with facts of value to anyone concerned in any way with changes to be effected through the contemplated mergers of American railroads into large competing systems.

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"It weighs the respective merits of the more recent type of regional consolidations and the older end-to-end type, and it attempts to gather, sift, and summarize in an orderly way the more important discussions of rail merger problems."—*Barron's.*

"A close student of the railroads, Mr. Chapman has assembled in this timely book a great deal of general statistical information, conveniently arranged, on the evolution of consolidations and unifications into the giant trunk lines of today."—*New York Daily Investment News.*

"The merger problem now confronting us is discussed in some detail with the probable benefits to be derived from the various proposals advanced by the Interstate Commerce Commission, and several others."—*The American Banker.*

"The author weighs the evidence on operating advantages and disadvantages, delves into the financial aspects, and explains the effect of mergers on the market action of railroad securities."—*Wall Street Journal.*

"The whole volume, including the appendices, forms a compact and convenient reference for those seeking data upon this live and disturbing transportation and financial problem—mergers." Professor G. Lloyd Wilson, University of Pennsylvania, in the *Annals of the American Academy of Political and Social Science.*

## *Some of the Features*

*Historical Survey*—advantages and disadvantages of mergers before 1920.

*Merger Problems Under the Transportation Act.* Maintenance of competition—Maintenance of existing routes and channels of trade—Valuation of properties—Exact provisions of the Act concerning consolidations—Relation between consolidations and unifications—Exact provisions of Act concerning unifications—Amendments in 1933.

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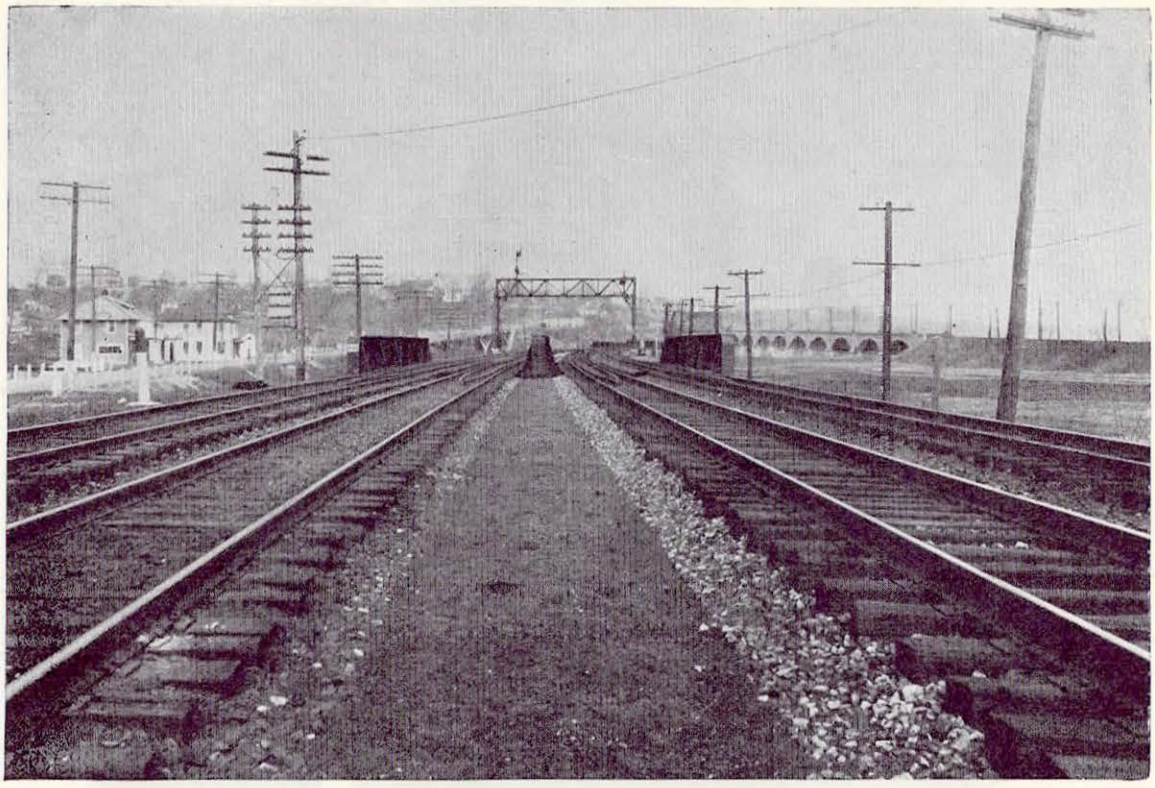
# MODERNISM . . .
# . . . not "Fadism"



MODERNISM, in its truest sense, is the adapting of fundamental policies and practices to fit the latest set of conditions. "Fadism" on the other hand, is the mere aping of ideas from other fields.

This distinction applies to construction or maintenance practices, just as truly as it does to motive power. For instance, modernism seeks every possible improvement in existing standards of timber preservation, just as it does in steam locomotives. "Fadism" on the other hand, lays great stress on relatively unimportant "new" features—like streamlining locomotives.

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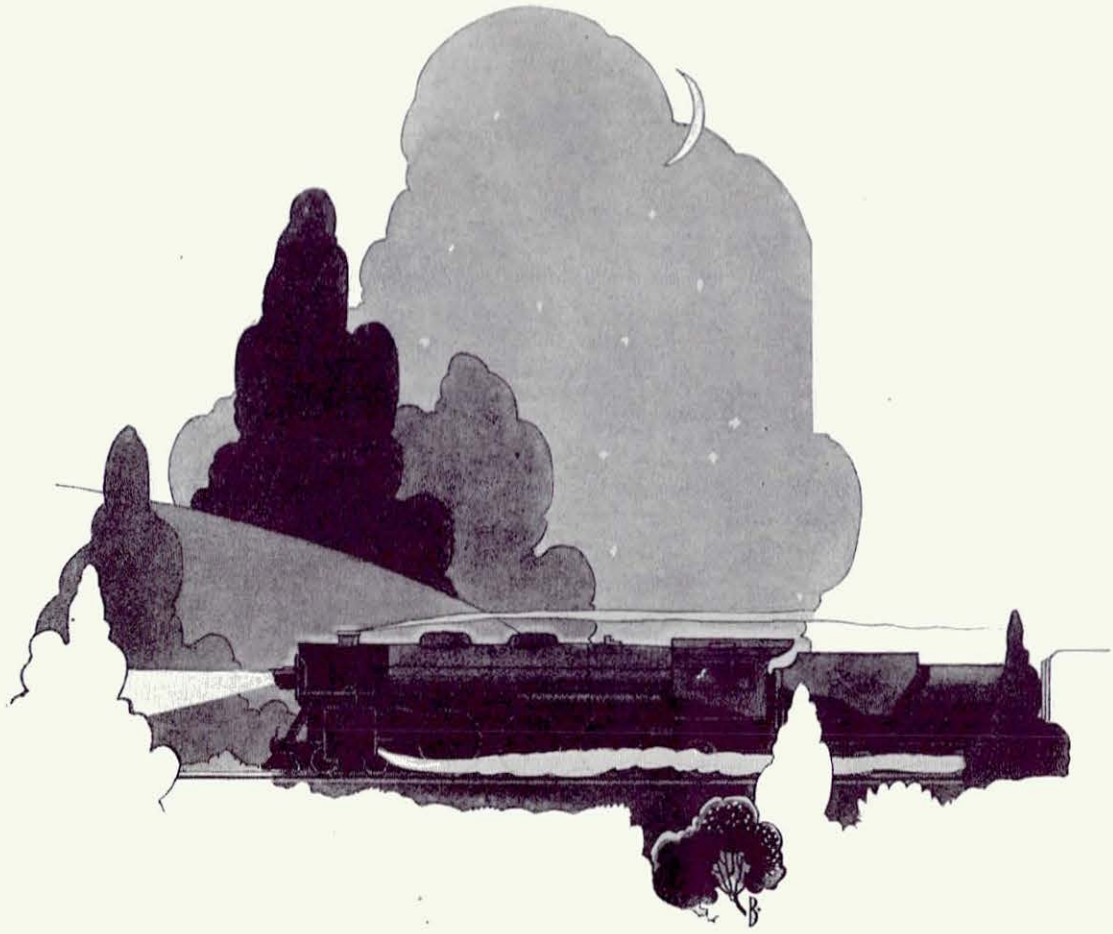
LOUISVILLE — KENTUCKY

# SPEEDING ALONG THRU THE NIGHT

*SCHEDULES TO MAINTAIN*

*SAFETY OF PASSENGERS AND CREW AT STAKE*



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# Railway Age

With which are incorporated the Railway Review, the Railroad Gazette and the Railway Age-Gazette. Name registered U. S. Patent Office

Vol. 98 March 23, 1935 No. 12

NRA CODE GRAPHIC ARTS INDUSTRY

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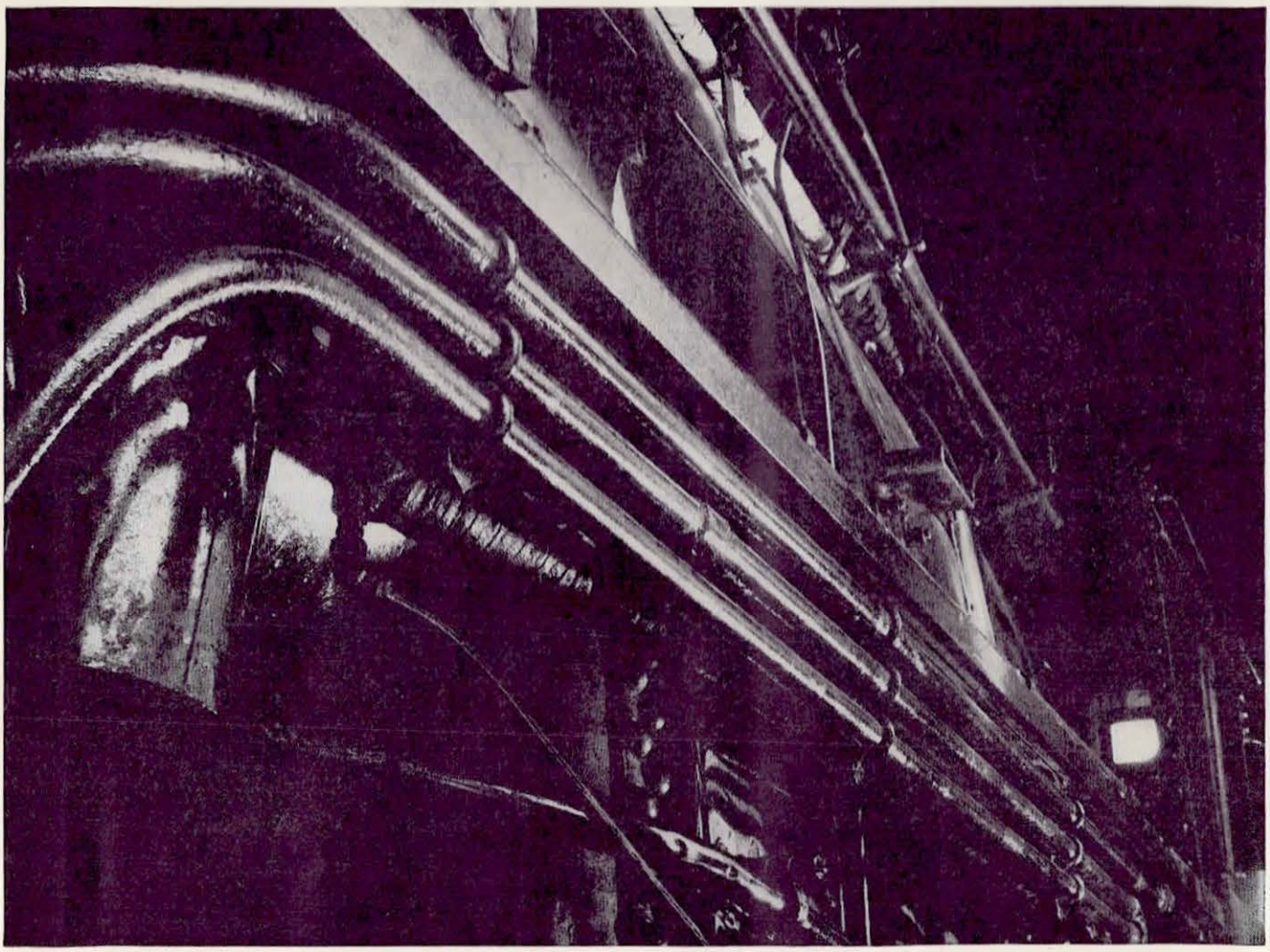
# THIS PIPE STAYS ON THE JOB

## FEWER REPAIRS WITH TONCAN IRON—THE IDEAL RAILROAD PIPE



Rust, vibration and sulphurous smoke, all working together, make plenty of trouble for railroad pipe.

Fortunately, Toncan Iron Pipe is well fortified against any or all of these attacks and therefore reduces repair bills.

So tough that it is widely used for staybolts, Toncan Iron also possesses exceptional resistance to rust and corrosion.

This modern pipe is an alloy of refined iron, copper and molybdenum. Throughout every stage of its manufacture it is processed to resist to a high degree the attacks of rust and corrosion. Consequently, its life in severe service is longer and its cost per year of use is less. In this age of waste elimination, Toncan Iron Pipe deserves full consideration.

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RAILWAY AGE

# Reform Plus Recovery

With ten millions unemployed and more than twice that number dependent upon relief, the acute problem of this country is economic recovery, and not reform, badly needed though the latter may be in the long run. This has been the opinion of the *Railway Age* since the depression assumed really serious proportions; and it is a belief shared by most economists—excepting, of course, the constitutional dissenters and mavericks who can attract larger audiences and hold better jobs when the people are poor and unhappy, than when they are prosperous. It is also agreed, by all except the perennial intransigeants, that the road to recovery lies in the revival of private investment in the durable goods industries. Measures, such as the holding company bill and the social security program, desirable though they may be in principle, have the definite effect of inhibiting new investment of private capital. Hence, in our opinion, they should be brought forward when private capital is full of confidence, rather than at a time when it is scared to death already.

### Transport Bills Would Serve Same End As Reform Program

But, assuming—as apparently is necessary—that reform is going to be put first anyhow, in spite of the sound reasons against it—then why should the purely reform aspects of the transportation problem be overlooked? These considerations are fully as cogent as holding company control and provisions for unemployment insurance and old age pensions. The reform motive behind the holding company bill—upon the wisdom of which we pass no judgment—is to prevent financial manipulators from stealing the savings of the people. By the same token, is not equally desirable reform implicit in safeguarding an investment made in transportation—at least to the extent of preventing its destruction by arbitrary discrimination and wasteful duplication of facilities by extravagant expenditure of the taxpayers' money?

Neither the Security Exchange Act nor the holding company bill, nor any other similar legislation, promises any protection to the savings of the small investor and the taxpayer from wanton misappropriation which is any more necessary than similar protection which would come from impartial regulation and the application of equality in self-support to all forms of transport. A man invests his money in a public utility and loses it by the machinations of financiers. Another buys a railroad bond and loses his savings because tax money is used to parallel the railroad with a highway or waterway upon which commercial carriers are permitted to operate with no control whatever and paying little or nothing for the facility provided for them. The investor loses in either case. What difference does it make to him whether the cause be a crooked manipulator or unsound politics?

If reform is needed to protect the investor in the one case, it is quite as just and quite as necessary in the other. The bills before Congress providing for regulation of highway and water carriers, and for the repeal of the fourth section of the Interstate Commerce Act are just as sound reform measures as any admittedly reform measures now pending. Indeed, they are a great deal sounder, because the subject matter of these bills has been debated and studied for years and substantial unanimity of intelligent opinion supports them—which is more than can be said for the hasty measures usually included under the category of reform legislation.

### Safeguarding Living Standards of Transportation Employees

George M. Harrison and other of the railway labor executives, we believe, in their proposal that the provisions of the railway labor act be applied to highway transportation employees, have drawn attention to a reform which is long overdue. The railway employees—those that are working—have achieved an enviable standard of wages and labor conditions. They have, however, been losing their jobs by the thousands, and even hundreds of thousands, because employees of competing forms of transportation are working longer hours for a fraction of railway wages. The disparity in wages have made railway rates higher and highway rates lower than they would be under conditions of equality of wages and working conditions. If it be conceded that a living wage is socially desirable, then certainly reasonable legislation to protect the living wage in the transportation industry is a desirable reform measure. It is a form of protection which employees of other industries already enjoy under the NRA codes. If the reformers are consistent, they cannot fail to recognize that equality of regulation for all forms of transportation and substantially equal working conditions and wages, is a reform which is needed in the interest of social security fully as much as any measure calculated to end other abuses by which people are robbed of their savings and the standard of living is lowered.

But the transportation regulation bills now before

Congress are a great deal more than reform measures. Unlike other reform measures which threaten recovery, the transportation regulation bills form the very keystone of any recovery program which will work. While exact figures are not available, it appears quite probable that one-fourth of the national income is being spent for transportation. The colossal waste involved in lack of co-ordination of the various agencies of transport—and their consequent senseless invasion of each other's fields of economic superiority—is cause enough alone for the general lack of confidence on the part of the investing public. The prevailing chaotic competitive conditions keep all forms of transportation impoverished and unprofitable. As long as they continue in that condition, private capital will not be invested in them in normal volume—and practically the only investments will be forced investments by the government of taxpayers' money. Such investments, however, only prolong the disease. Public confidence in the profitability of the transportation industry and the investment of private capital in it can come only when the industry forswears its uneconomic practices and gives promise of earning a profit without the aid of taxpayers' money. Can any sound business recovery be expected in a society while the service for which that society spends one-fourth of its income is chaotic and wasteful?

This is not a problem of the railroad industry. It is the problem of the entire transportation industry, and of society as a whole. For the railroads to give up the traffic which they are handling which can be more economically handled by truck, may appear to be a sacrifice. Similarly for the trucks, under regulation, working conditions and taxation comparable to those of the railways, to give up some traffic to the railways may appear to be an act of impractical altruism. And yet that is the price which both agencies must pay if they are to put an end to the waste in transportation and thus revive profits and public confidence in the industry. If they could succeed in doing this, the revival in traffic which would certainly follow would recompense them handsomely for their initial sacrifice.

### Measures Before Congress Are Only a Start—But They Are a Start

It is, of course, obvious that the bills now before Congress for equalizing competitive conditions in transportation do not promise final solution to all problems of the industry—far from it. Indeed they do not deal with the troublesome question of taxation at all, and, unless the amendment suggested by Mr. Harrison is accepted, they do nothing toward equalizing wages and working conditions. Still, Rome was not built in a day; and a complete theoretical solution of all the problems of the transportation industry is not a prerequisite to dealing definitively with some of them. The matter of comparable regulation is a question which has been discussed for a decade, and upon which there is, probably, a greater degree of unanimity of informed opinion than exists regarding any other important public question. For Congress and the Administration to fail to act at once to put these bills on the statute books would be a dereliction which would badly affect business confidence.

The issue is one which vitally affects every citizen. The confidence of business in the government and our economic future will not, and cannot, revive while it fails to deal realistically with an issue as obvious and imperative as this one is. Perhaps there are other measures also which are essential to complete economic recovery—but certainly recovery can never come while the government delays making even a beginning in dealing with the severe illness of an industry which bulks as importantly in our national economic life as transportation. Recovery or reform—the program for neither the one nor the other can succeed unless transportation recovery, or transportation reform, is included.

## Standardization— A Reform or a Fetish

For the second time within a year the American Railway Engineering Association has rejected designs for standard tie plates prepared by one of its committees and submitted by it for adoption. This experience demonstrates that true standardization is a slow process, especially in harmonizing designs for a device that is already widely used. It also illustrates how not to proceed in standardization.

Acting under pressure from the federal co-ordinator late in the summer of 1933, the committee worked so hurriedly that the designs which it prepared and presented to the association were not satisfactory even to a considerable number of members of the committee itself, and they were rejected by the association at its convention last March. The committee then resumed its work and presented new standards, limited to two designs of plates for each of the two sections of rail adopted recently. Within recent weeks the association has rejected these designs by letter ballot. The negative vote in this instance indicates the unwillingness on the part of railway engineers to accept such a limited choice.

By its action, the association has dealt standardization a blow, but one that was inevitable in view of the procedure adopted. The association, by its action, has again demonstrated that it is seldom practicable to hasten the standardization of a device in a field where a large diversity of ideas and of practices prevails. In justice to the committee, it may be said that it worked against time, but with the result that its efforts have met with failure.

This experience affords a good illustration of the problems involved in bringing about standardization. In the first place, it cannot be hurried, but should be preceded by a careful survey of current practices, the

nature and extent of the deviations and the reasons therefor, and the detrimental results following. Not only does this constitute a fact-finding period, but it is one of education of users as well. Without it, either ill-advised efforts towards standardization or refusal to accept the standards adopted will result.

An even more important consideration is that of practical approach to the problem. It is the common experience in other industries that the novice approaches standardization with an entire willingness to impose his ideas on others. Yet, especially in a field where literally hundreds of designs are in use, it is the almost universal experience that it is entirely unpractical to endeavor to reduce these designs to two or even to a dozen at one swoop. It is too much to expect, therefore, that the railways will universally or even largely give up their individual ideas regarding tie plate designs en masse for some one design which they are not convinced is superior. If, on the other hand, they were offered a limited number of variations in design to select from, they can usually find some one design which is sufficiently close to their ideas to warrant their acceptance. If, by this means, the number of designs can be reduced from a hundred to a dozen or two, real progress will be made.

Another condition that is retarding standardization is the implication that the adoption of standards will be made compulsory on the roads. Whether the standards in question be good or bad, human nature is such that it is difficult to impose them arbitrarily on an unwilling person. We have just emerged from a "great experiment" in this country in which the will of one group was imposed on all in a matter of personal habit. The basic reason for this failure applies also to compulsory standardization.

But, more important than all, is the consideration of the practical limit to which standardization should proceed. The objective of standardization is, of course, economy in manufacture and in cost to the railways. The magnitude of this economy and the point at which it ends are frequently over-estimated. Take tie plates, for illustration, with an average annual production in normal years of 500,000 tons and with a life of rolls approximating 10,000 tons. It is evident that little increase in cost is incurred by a limited diversity of sections. The difficulty arises from the occasional order for a small tonnage of a special section.

No one will defend the present wide diversity of designs that prevails with respect to many railway appliances. Equally unwise, however, is the pressure for *rigid* standardization. It is not only unnecessary to the attainment of the objectives sought by standardization, but it actually retards the attainment of those objectives. What is needed today is a slow, carefully-planned program of standardization which will be sufficiently convincing in its presentation to win acceptance, and, at the same time, sufficiently flexible to permit some degree of individual initiative and avoid setting up a rigid barrier to progress.

# A Constructive Week

If there were any doubt regarding the advisability of the American Railway Engineering Association returning to its normal three-day convention schedule after four years of curtailed sessions, that doubt was dispelled last week, for the convention disclosed an interest and an enthusiasm that had been lacking since 1930. The attendance of members was larger than in any year since 1931, being 20 per cent above that of a year ago and 50 per cent more than in 1933.

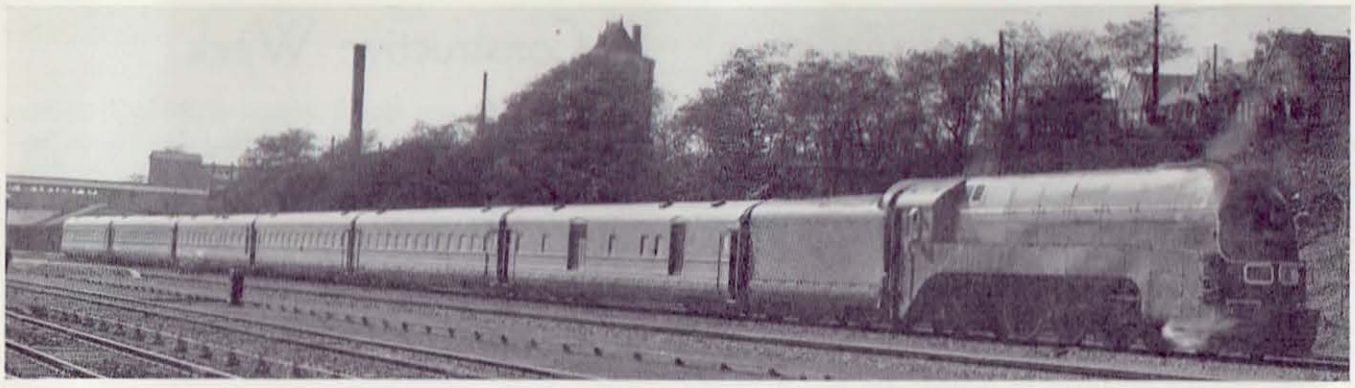
The committees were afforded opportunity to present their reports in greater detail, which added much to their value. Equally important, the members felt less restrained as to time and, as a result they participated more freely in those questions that were open to divided opinion.

Especially was the foregoing true with respect to the presentation of specifications for steel railway bridges, with which the committee brought to a conclusion a study of some 10 years' duration. Not content to accept the conclusions of the committee blindly, the members questioned numerous points in detail and it was only after these points were cleared up to their satisfaction that the specifications were approved. In a similarly thorough manner, the reports of several of the committees were reviewed on the floor and in a number of instances they were referred back for further study or clarification of debated points.

The meeting of the Signal section, A.A.R., was equally constructive. The registration at this meeting likewise exceeded that for any year since 1931. At this meeting final action was taken on several subjects of importance to the railways, including the study of track circuits to determine means for securing more effective shunting for light-weight trains and the adoption of new specifications for lightning arresters. Especially important to railway operation was the clarification of the use of call-on signals.

A contribution of great value to the conventions of these two organizations was the resumption of exhibits of engineering and signaling materials and equipment by the National Railway Appliances Association. Here more than 90 manufacturers presented their products, full size and in working order. Many of the exhibits took on the nature of practical demonstrations, one exhibitor making more than 1,000 such demonstrations in the four days the exhibit was open.

These organizations, through their meetings and exhibit, have made a definite contribution to the promotion of more efficient methods at a time when increased efficiency is so much to be desired. Equally important, they have made a definite contribution to the morale of those railway officers and railway supply men who participated. All three of these organizations have made outstanding contributions to railway operation during the more than a third of a century in which they have been active. The meetings this year added further to this record.



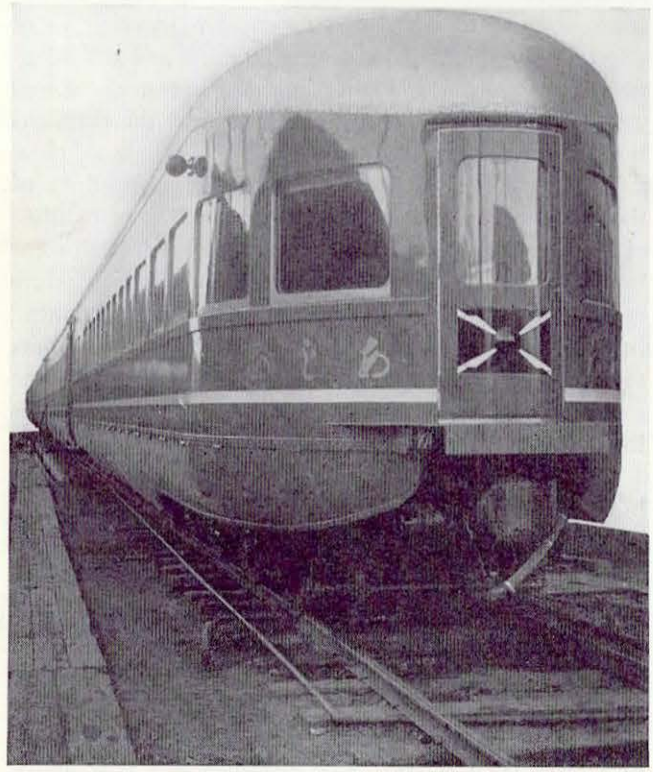
South Manchuria Railway Streamlined Train "Asia"

# Streamlined Train "Asia" for South Manchuria Railway

## Locomotive and six cars fully streamlined—Conditions on American railways paralleled

ONE of the recent trains of the streamlined type to be placed in service is that which bears the name "Asia," now operating on the South Manchuria Railway between Dairen and Hsinking (formerly Changchun), the capital of Manchoukuo. It consists of a Pacific type steam locomotive and six or more passenger coaches, all fully streamlined.

At the present time the high-speed express train "Asia" covers the 436 miles between Dairen and Hsinking in eight and one-half hours elapsed time or at an average speed of 51.2 m.p.h. Upon completion of the work now being done on the road bed—including reductions in grades and curves—it is planned to shorten this schedule to seven hours, thus raising the average speed to 63 m.p.h. and permitting the use of a maximum speed of 87 m.p.h. where conditions are favorable. Furthermore, the North Manchuria Railway (Chinese Eastern) now having been transferred to Manchoukuo, the track gage is being changed from 5 ft. to 4 ft. 8½ in. and the roadway generally rehabilitated. When this additional work is completed the run will be extended from Dairen through to Harbin, nearly 600 miles.



Observation End of South Manchuria Train "Asia"

The train was built at the shops of the railroad from materials mostly either native or of Japanese manufacture. In addition to being streamlined the train is rendered doubly striking by the color scheme adopted. The locomotive is painted a deep indigo and the coaches a light olive, with a white stripe running throughout the length of the train. Besides the locomotive there are six passenger cars; namely, one baggage and mail car, two third-class passenger cars, one dining car, one second-class passenger car and one first-class passenger and observation car. For emergency either a second-class or a first-class passenger car can be added between the last two cars.

### General Description of the Locomotive

Due to the necessity of building an engine within a limited axle weight and yet capable of producing the necessary steam for high speed operation, all parts were made as light as possible. For this reason special cast steel was used for the cylinders, nickel-steel plates for the boiler shell, high quality manganese cast steel for the main frames, and aluminum alloy for the brake cylinders, steam-cylinder front covers, and all oil and grease cellars.

Though the general design is based largely upon American practices, the firebox has certain features designed to

make it suitable for using Fushun coal and several other parts were adapted to local conditions.

The locomotive itself weighs 262,010 lb., of which 157,560 lb. is on the drivers, 54,010 on the front truck, and 50,440 lb. on the trailing truck. The tender, which weighs 186,300 lb. loaded, has a capacity for 9,780 U. S. gal. of water and 13.2 tons of coal. The driving-wheel base is 13 ft. 7¾ in., the engine wheel base is 36 ft. and the total wheel base of engine and tender is 73 ft. 6$^{3}/_{32}$ in. The two cylinders have a diameter of 23$^{5}/_{16}$ in. and a stroke of 27$^{61}/_{64}$ in. The driving wheels are 78¾ in. in diameter over the tires. The valve gear is of the Walschaert type, operating 12-in. piston valves with a maximum travel of 8½ in. and 81 per cent cut-off in full gear. The tractive force at 80 per cent boiler pressure is 34,950 lb.

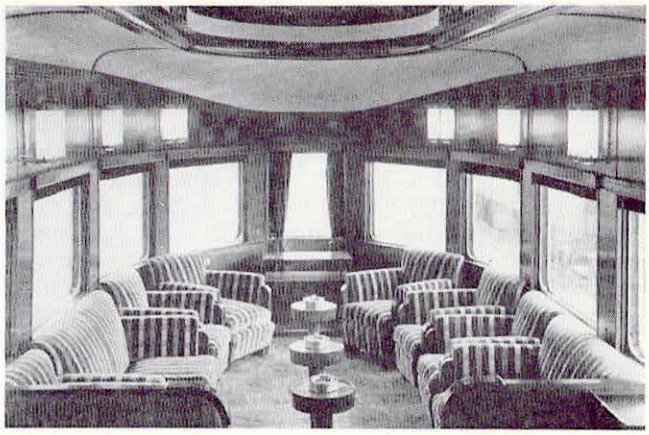
Nickel cast-iron bushings are used for the cylinders and valve chambers. The crossheads are steel forgings with nickel steel shoes. Springs are of silicon-manganese steel. All axles and crank pins are hollow-bored and heat treated. SKF spherical roller bearings are used on the eccentric-rod end and the union link is of strong aluminum alloy.

### The Boiler

The boiler is of the extended wagon-top type, 77$^{5}/_{32}$ in. inside diameter at the first course and 87$^{27}/_{32}$ in. outside diameter at the third course. The boiler pressure is 220 lb. The firebox is 114$^{15}/_{16}$ in. long by 84¼ in. wide, which gives a grate area of 67.3 sq.ft. The firebox is fitted with a brick arch carried on arch tubes and a combustion chamber 42-in. long is provided. The boiler has 70 2-in. tubes and 132 3$^{33}/_{64}$-in. flues—the length over tube sheets being 16 ft. 10¾ in. The total firebox heating surface is 316 sq.ft.; tubes and flues, 2,671 sq.ft., evaporative, 2,987 sq.ft. The Type E superheater has a heating area of 1,100 sq.ft. The coal is fed by a steam jet type stoker. The fire door is of the butterfly type. A closed type feedwater heater is provided.

The throttle is of the multiple-valve type, the air-brake equipment Schedule 6-ET, the power reverse gear of the Alco type, and the trailing truck of the Delta type.

The application of the streamline cover to the locomotive was made in such a way as not to interfere with inspections, boiler washing, or general repair work. Pressed channels are used for the skeleton framework of the streamline cover with aluminum and bright-finished steel sheets for the cover itself. A smoke deflector was provided as shown in the photographs.



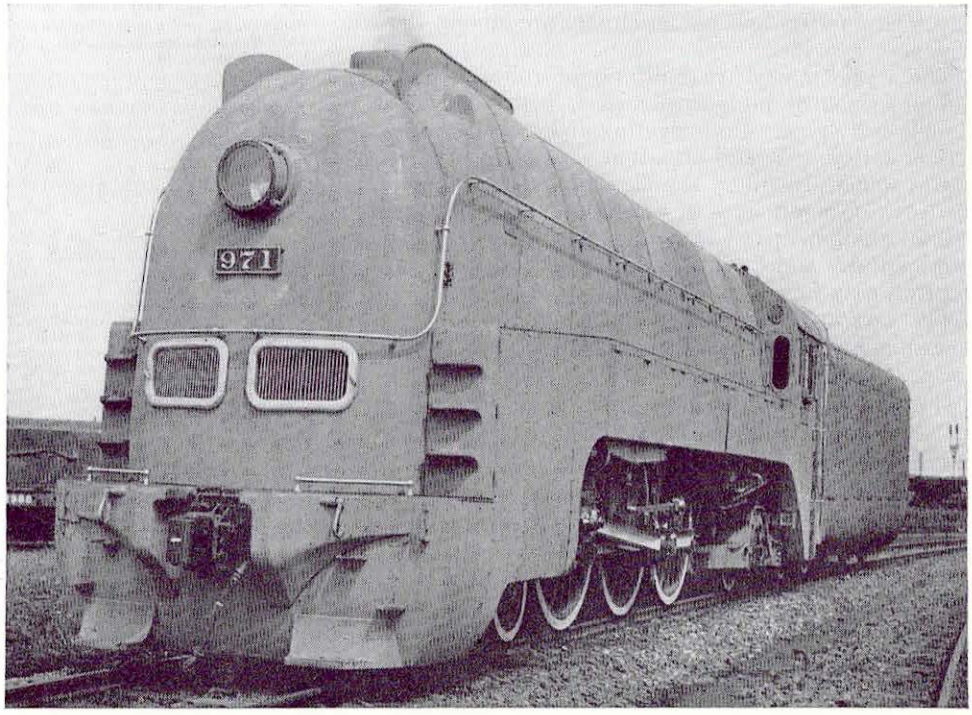
Rear End of First-Class Passenger and Observation Car

The tender trucks are of the four-wheel swing-bolster type equipped with Timken roller bearings. The tank roof is covered with the same section as the passenger cars and the coal bunker is fitted with an aluminum cover which can be readily opened or closed. A diaphragm is placed between the tender tank and the first passenger car, while wheel covers are provided for the tender trucks. Automatic couplers and ring-spring draft gears are fitted.

### Construction of the Cars

In order to keep down the weight of the car bodies light alloys of aluminum and magnesium were used as much as possible, and a special high-strength steel was employed for the frame. The sectional area of the cars was reduced and a further saving in weight was obtained by the extensive use of welding in the fabrication.

An air-conditioning system of the steam-ejector type is installed in all the cars except the baggage and mail

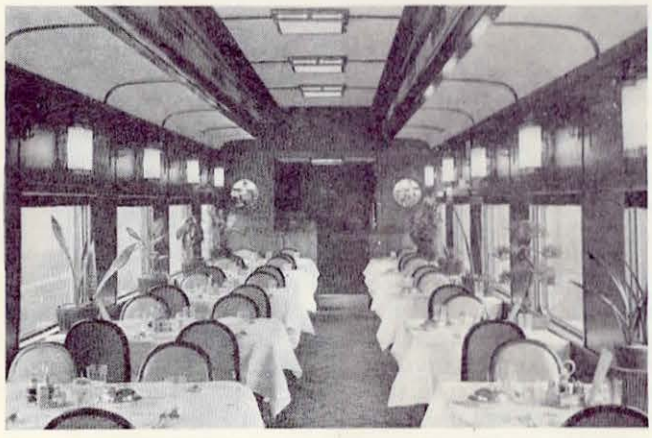



Streamlined Pacific Type Locomotive on South Manchuria Railway Weighs 448,310 lb. with Tender—Has 34,950 lb. Rated Tractive Force—Designed to Haul Six-Car Train Weighing 353 Tons at a Top Speed of 87 m.p.h.

car. Brakes are Westinghouse LN type, with clasp brakes on the trucks.

All cars have a width of 10 ft., a total height from rail of 13 ft. 9 in. and 35-in. coupler height. The length between coupler knuckles of all cars is 80 ft. 5 in. and the length between truck centers is 55 ft. 10 in., the truck wheel base being 10 ft. 10 in. The weight of the various cars ranges from 100,000 lb. for the baggage and mail car to 123,500 lb. for the dining car. The combined weight of the six cars, which usually constitute the train, is 706,500 lb., or an average weight of 117,750 lb. per car.

The car roofs are of the turtle-back or plain curved type, while the inside ceilings have the appearance of a clerestory, part of the space between the ceiling and the roof being used for the side ducts of the air-conditioning system. The third-class car has double facing seats, providing space for 88 passengers. The second-class coach is fitted with 17 revolving double seats on each side, providing space for 68 passengers. The dining car has seats for 36 in the main room, with provision at one end for a waiting room with seats for six persons. The kitchen has an oil range. The first-class passenger and observation car has revolving double seats for 30 passengers in one end. Reading and writing facilities, with sofas and



Interior View of Dining Car

arm chairs, are provided in the observation room. Lavatories, toilets and parcel closets are among the conveniences provided.

The underframes are built up of rolled-steel shapes and pressings of high-tensile steel, with center sills of the fish-belly type. Both riveting and welding were used in fabrication. Careful attention was given to insulation and to sound-proofing. Double windows with metal sash are used. The outsides of the roller curtains are painted with aluminum to reflect heat. An idea of the pleasing interior finish and decorations, together with the lighting fixtures, may be obtained from the illustrations.

The cars are vestibuled, and in addition to the usual inner diaphragm an outer diaphragm is used which conforms closely to the cross-section of the car body. A fireproof cover is also placed on top of this outer diaphragm. For convenience in coupling, uncoupling and inspection the lower part of the outer diaphram is made separable.

In order to make the streamlining more complete side covers are attached to the bottoms of the side frames. These are made up of steel angles to which aluminum sheets are attached and are divided into short sections so that any one of them may be pulled open and hooked up to the belt rail for inspection purposes.

The six-wheel trucks have 36-in. rolled steel wheels and are fitted with SKF double roller bearings. Truck frames and bolsters are built up by welding from high tensile steel. Rubber inserts are provided liberally to reduce noise.

Couplers are of the familiar automatic type and draft gears are of the ring-spring type.

# Net Deficit for 1934, $32,251,184

WASHINGTON, D. C.

CLASS I railroads of the United States in 1934 had a net deficit of $32,251,184, as compared with a net deficit of $13,779,866 in 1933, according to the Interstate Commerce Commission's compilation of selected income and balance-sheet items. The net railway operating income for the year was $462,716,441, which

**Selected Income and Balance-Sheet Items of Class I Steam Railways in the United States**

Compiled from 143 reports (Form IBS) representing 149 steam railways

TOTALS FOR THE UNITED STATES (ALL REGIONS)

| For the month of December 1934 | For the month of December 1933 | Income Items | For the twelve months of 1934 | For the twelve months of 1933 |
|---|---|---|---|---|
| $38,747,819 | $37,726,339 | 1. Net railway operating income | $462,716,441 | $474,212,301 |
| 28,819,497 | 37,129,929 | 2. Other income | 182,414,719 | 193,471,482 |
| 67,567,316 | 74,856,268 | 3. Total income | 645,131,160 | 667,683,783 |
| 10,967,416 | 11,687,844 | 4. Rent for leased roads | 133,653,480 | 133,399,312 |
| 45,456,656 | 45,781,242 | 5. Interest deductions | 522,932,403 | 532,016,719 |
| 1,906,289 | 2,648,114 | 6. Other deductions | 20,796,461 | 16,047,618 |
| 58,330,361 | 60,117,200 | 7. Total deductions | 677,382,344 | 681,463,649 |
| 9,236,955 | 14,739,068 | 8. Net income | *d32,251,184* | *d13,779,866* |
| | | 9. Dividend declarations (from income and surplus): | | |
| †31,584,868 | 12,340,312 | 9-01. On common stock | †114,630,342 | 78,096,195 |
| 3,635,197 | 4,976,396 | 9-02. On preferred stock | 18,163,125 | 17,437,427 |

Balance-Sheet Items

*Selected Asset Items*

| | Balance at end of December 1934 | Balance at end of December 1933 |
|---|---|---|
| 10. Investments in stocks, bonds, etc., other than those of affiliated companies (Total, Account 707) | $807,845,643 | $741,664,762 |
| 11. Cash | 335,456,771 | 305,797,072 |
| 12. Demand loans and deposits | 12,543,803 | 38,510,093 |
| 13. Time drafts and deposits | 31,880,938 | 49,728,805 |
| 14. Special deposits | 69,502,955 | 44,454,759 |
| 15. Loans and bills receivable | 6,040,583 | 7,625,143 |
| 16. Traffic and car-service balances receivable | 52,509,023 | 51,905,275 |
| 17. Net balance receivable from agents and conductors | 41,013,677 | 38,715,569 |
| 18. Miscellaneous accounts receivable | 149,798,726 | 140,142,380 |
| 19. Materials and supplies | 297,465,161 | 291,298,354 |
| 20. Interest and dividends receivable | 45,627,690 | 43,560,344 |
| 21. Rents receivable | 2,843,074 | 1,725,587 |
| 22. Other current assets | 10,475,328 | 4,812,551 |
| 23. Total current assets (items 11 to 22) | $1,055,157,729 | $1,018,275,932 |

*Selected Liability Items*

| | | |
|---|---|---|
| 24. Funded debt maturing within 6 months* | $225,119,036 | $296,930,365 |
| 25. Loans and bills payable‡ | 318,939,591 | 337,909,643 |
| 26. Traffic and car-service balances payable | 66,449,772 | 65,946,988 |
| 27. Audited accounts and wages payable | 197,988,671 | 198,656,824 |
| 28. Miscellaneous accounts payable | 81,247,010 | 49,687,252 |
| 29. Interest matured unpaid | 342,742,299 | 258,177,020 |
| 30. Dividends matured unpaid | 14,155,277 | 14,096,828 |
| 31. Funded debt matured unpaid | 273,272,973 | 97,092,060 |
| 32. Unmatured dividends declared | 8,402,871 | 9,046,307 |
| 33. Unmatured interest accrued | 91,999,955 | 93,981,811 |
| 34. Unmatured rents accrued | 23,620,887 | 22,079,179 |
| 35. Other current liabilities | 26,858,534 | 20,451,316 |
| 36. Total current liabilities (items 25 to 35) | $1,445,677,840 | $1,167,125,228 |
| 37. Tax liability (Account 771): | | |
| 37-01. U. S. Government taxes | 32,581,324 | 31,217,795 |
| 37-02. Other than U. S. Government taxes | 124,043,635 | 135,335,313 |

† Includes $20,562,500 dividends appropriated from surplus by Duluth, Missabe & Northern Ry.

* Includes payments which will become due on account of principal of long-term debt (other than that in Account 764, Funded debt matured unpaid) within six months after close of month of report.

‡ Includes obligations which mature less than two years after date of issue.

*d* Deficit.

also represented a decrease as compared with 1933, in spite of an increase in traffic, and the other income, $182,414,719 also represented a small decrease, while interest and other deductions from income totaled $677,382,344. Dividend declarations for the year amounted to $132,793,467, as compared with $95,533,622 in 1933. Total current assets at the close of the year were $1,055,157,729, while the total current liabilities amounted to $1,445,677,840.

Eighty-nine of the 143 Class I roads whose reports are included in the compilation had net deficits for the year. The commission's summary and the principal items for the individual roads are shown in the accompanying tables.

## Selected Income Items by Regions and Districts, Class I Steam Railways, Calendar Years 1934 and 1933

| Region and Railway | Net Railway Operating Income 1934 | Net Railway Operating Income 1933 | Total Income 1934 | Total Income 1933 | Total Deductions 1934 | Total Deductions 1933 | Net Income 1934 | Net Income 1933 |
|---|---|---|---|---|---|---|---|---|
| Eastern District: | | | | | | | | |
| New England Region | $16,110,918 | $18,992,776 | $27,381,709 | $29,060,045 | $32,989,097 | $33,485,627 | *d$5,607,388* | *d$4,425,582* |
| Great Lakes Region | 76,654,180 | 73,400,121 | 110,030,808 | 107,741,216 | 125,684,146 | 128,742,117 | *d15,653,338* | *d21,000,001* |
| Central Eastern Region | 113,826,905 | 121,244,583 | 166,530,321 | 175,931,463 | 149,722,338 | 152,015,355 | 16,807,983 | 23,916,108 |
| Total, Eastern District | 206,592,003 | 213,637,480 | 303,942,838 | 312,732,724 | 308,395,581 | 314,243,099 | *d4,452,743* | *d1,510,375* |
| Southern District: | | | | | | | | |
| Pocahontas Region | 66,732,626 | 68,133,366 | 70,778,730 | 73,135,762 | 18,353,123 | 19,167,571 | 52,425,607 | 53,968,191 |
| Southern Region | 54,523,778 | 59,677,488 | 65,595,616 | 69,898,712 | 84,824,083 | 85,946,793 | *d19,228,467* | *d16,048,081* |
| Total, Southern District | 121,256,404 | 127,810,854 | 136,374,346 | 143,034,474 | 103,177,206 | 105,114,364 | 33,197,140 | 37,920,110 |
| Western District: | | | | | | | | |
| Northwestern Region | 41,386,207 | 41,637,286 | 61,237,810 | 64,832,264 | 100,363,757 | 94,930,871 | *d39,125,947* | *d30,098,607* |
| Central Western Region | 71,141,545 | 67,882,462 | 117,207,192 | 117,999,047 | 105,331,731 | 106,089,771 | 11,875,461 | 11,909,276 |
| Southwestern Region a | 22,340,282 | 23,244,219 | 26,368,974 | 29,085,274 | 60,114,069 | 61,085,544 | *d33,745,095* | *d32,000,270* |
| Total, Western District | 134,868,034 | 132,763,967 | 204,813,976 | 211,916,585 | 265,809,557 | 262,106,186 | *d60,995,581* | *d50,189,601* |
| United States | 462,716,441 | 474,212,301 | 645,131,160 | 667,683,783 | 677,382,344 | 681,463,649 | *d32,251,184* | *d13,779,866* |
| Akron, Canton & Youngstown Ry.* | 286,761 | 322,599 | 437,696 | 470,790 | 321,258 | 352,463 | 116,438 | 118,327 |
| Atchison, Topeka & Santa Fe Ry. b | 15,229,319 | 13,961,760 | 20,179,851 | 16,957,827 | 13,178,537 | 13,259,156 | 7,001,314 | 3,698,671 |
| Atlantic Coast Line System: | | | | | | | | |
| Atlanta & West Point R. R. | *d153,636* | *d231,983* | *d132,177* | *d208,785* | 1,371 | 1,115 | *d133,548* | *d209,900* |
| Atlanta, Birmingham & Coast R. R. | *d333,300* | *d250,846* | *d299,806* | *d206,129* | 17,758 | 17,246 | *d317,564* | *d223,375* |
| Atlantic Coast Line R. R. | 4,289,557 | 4,299,811 | 7,076,445 | 5,376,803 | 7,571,923 | 7,762,591 | *d495,478* | *d2,385,788* |
| Charleston & Western Carolina Ry. | 381,262 | 435,489 | 407,247 | 462,129 | 304,509 | 309,218 | 102,738 | 152,911 |
| Clinchfield R. R. | 2,043,294 | 1,894,874 | 2,591,763 | 2,646,763 | 2,591,763 | 2,646,763 | — | — |
| Georgia R. R. —Lessee Organization | 578,957 | 537,712 | 597,466 | 560,464 | 695,032 | 704,792 | *d97,566* | *d144,328* |
| Louisville & Nashville R. R. | 12,967,297 | 11,857,688 | 13,777,330 | 12,844,708 | 10,809,945 | 11,048,992 | 2,967,385 | 1,795,716 |
| Nashville, Chattanooga & St. Louis Ry. | 953,544 | 992,602 | 1,197,237 | 1,277,521 | 1,549,176 | 1,569,847 | *d351,939* | *d292,326* |
| Western Ry. of Alabama | *d55,650* | *d84,879* | *d12,086* | *d42,944* | 70,528 | 70,384 | *d82,614* | *d113,328* |
| Baltimore & Ohio System: | | | | | | | | |
| Alton R. R. | 221,040 | 1,847,341 | 305,257 | 1,964,757 | 1,949,836 | 2,008,008 | *d1,644,579* | *d43,251* |
| Baltimore & Ohio R. R. | 23,677,939 | 28,849,201 | 30,173,071 | 35,067,222 | 33,998,823 | 34,862,450 | *d3,825,752* | 204,772 |
| Staten Island Rapid Transit Ry. | *d242,795* | 12,675 | 489,306 | 482,112 | 489,306 | 482,112 | — | — |
| Bangor & Aroostook R. R. | 1,693,743 | 1,741,500 | 1,739,031 | 1,800,568 | 791,637 | 806,992 | 947,394 | 993,576 |
| Bessemer & Lake Erie R. R. | 1,307,203 | 1,703,552 | 1,537,705 | 2,128,683 | 1,147,296 | 755,060 | 390,409 | 1,373,623 |
| Boston & Maine R. R. | 6,893,514 | 7,068,315 | 7,923,658 | 8,151,028 | 7,630,165 | 7,829,457 | 293,493 | 321,571 |
| Burlington-Rock Island R. R. | *d283,443* | *d37,376* | *d276,000* | *d1,212* | 751,449 | 751,885 | *d1,027,449* | *d753,097* |
| Burlington Route: | | | | | | | | |
| Chicago, Burlington & Quincy R. R. | 12,650,936 | 13,491,225 | 13,905,104 | 15,053,054 | 9,450,344 | 9,455,030 | 4,454,760 | 5,598,024 |
| Colorado & Southern Ry. | 144,619 | 255,823 | 1,428,987 | 1,353,632 | 2,283,125 | 2,297,022 | *d854,138* | *d943,390* |
| Fort Worth & Denver City Ry. | 1,239,355 | 1,567,284 | 1,362,029 | 1,693,974 | 1,415,827 | 1,281,162 | *d53,798* | 412,812 |
| Cambria & Indiana R. R. | 657,824 | 949,124 | 701,146 | 1,051,468 | 117,744 | 124,951 | 583,402 | 926,517 |
| Canadian National System: | | | | | | | | |
| Canadian National Lines in New England | *d780,952* | *d815,522* | 663,559 | 575,989 | 566,679 | 548,250 | 96,880 | 27,739 |
| Central Vermont Ry. | 109,574 | 328,421 | 140,729 | 361,599 | 1,208,921 | 1,237,067 | *d1,068,192* | *d875,468* |
| Duluth, Winnipeg & Pacific Ry. | *d43,050* | 71,443 | 830,495 | 646,525 | 503,348 | 539,739 | 327,147 | 106,786 |
| Grand Trunk Western R. R. | 392,467 | *d954,401* | 1,230,849 | *d541,590* | 2,870,813 | 3,325,088 | *d1,639,964* | *d3,866,678* |
| Canadian Pacific System: | | | | | | | | |
| Canadian Pacific Lines in Maine | *d38,382* | *d108,473* | 146,580 | 146,580 | 146,580 | 146,580 | — | — |
| Canadian Pacific Lines in Vermont | *d462,482* | *d397,753* | 264,066 | 264,066 | 264,066 | 264,066 | — | — |
| Duluth, South Shore & Atlantic Ry. | 138,595 | 58,390 | 123,581 | 44,977 | 950,725 | 1,036,466 | *d827,144* | *d991,489* |
| Minneapolis, St. Paul & Sault Ste. Marie Ry. | 1,243,926 | 1,016,850 | 1,213,457 | 1,116,469 | 6,292,000 | 5,937,615 | *d5,078,543* | *d4,821,146* |
| Spokane International Ry. | *d57,253* | *d97,804* | *d52,295* | *d92,812* | 272,855 | 272,864 | *d325,150* | *d365,676* |
| Chesapeake & Ohio Ry. | 36,997,795 | 36,967,128 | 38,051,290 | 38,675,807 | 9,988,887 | 10,435,997 | 28,062,403 | 28,239,810 |
| Chicago & Eastern Illinois Ry. | 641,697 | 207,297 | 789,964 | 341,447 | 2,284,164 | 2,361,951 | *d1,494,200* | *d2,020,504* |
| Chicago & Illinois Midland Ry. | 804,488 | 1,003,023 | 1,049,900 | 1,246,858 | 906,624 | 925,634 | 143,276 | 321,224 |
| Chicago & North Western System: | | | | | | | | |
| Chicago & North Western Ry. | 5,202,104 | 6,031,714 | 8,539,846 | 9,473,869 | 16,816,040 | 17,349,288 | *d8,276,194* | *d7,875,419* |
| Chicago, St. Paul, Minneapolis & Omaha Ry. | 601,985 | 1,537,543 | 687,178 | 1,627,082 | 2,610,388 | 2,687,307 | *d1,923,210* | *d1,060,225* |
| Chicago Great Western R. R. | 1,340,269 | 1,280,914 | 1,490,166 | 1,464,830 | 1,958,989 | 1,979,655 | *d468,823* | *d514,825* |
| Chicago, Indianapolis & Louisville Ry. | 119,800 | *d21,083* | 145,478 | 83,715 | 1,561,792 | 1,598,182 | *d1,416,314* | *d1,514,467* |
| Chicago, Milwaukee, St. Paul & Pacific R. R. | 6,539,054 | 8,597,319 | 7,941,063 | 9,862,269 | 24,188,684 | 24,274,410 | *d16,247,621* | *d14,412,141* |
| Columbus & Greenville Ry. | *d3,410* | 92,142 | 16,894 | 112,865 | 24,266 | 27,373 | *d7,372* | 85,492 |
| Delaware & Hudson R. R. | 2,118,875 | 1,016,991 | 2,307,263 | 1,236,983 | 4,908,326 | 4,936,755 | *d2,601,063* | *d3,699,772* |
| Delaware, Lackawanna & Western R. R. | 4,504,180 | 3,480,300 | 6,024,716 | 5,595,748 | 7,997,329 | 8,589,610 | *d1,972,613* | *d2,993,862* |
| Denver & Rio Grande Western R. R. | 2,311,564 | 3,357,642 | 2,796,082 | 3,518,630 | 5,771,954 | 5,657,583 | *d2,975,872* | *d2,138,953* |
| Denver & Salt Lake Ry. | 913,122 | 711,348 | 1,012,952 | 845,327 | 899,828 | 841,181 | 113,124 | 4,146 |
| Detroit & Mackinac Ry. | 101,920 | 46,845 | 107,506 | 46,976 | 121,851 | 121,988 | *d14,345* | *d75,012* |
| Detroit & Toledo Shore Line R. R. | 731,070 | 570,755 | 746,849 | 630,195 | 123,285 | 126,596 | 623,564 | 503,599 |
| Detroit, Toledo & Ironton R. R. | 1,953,028 | 1,076,319 | 1,977,024 | 1,198,875 | 839,235 | 856,514 | 1,137,789 | 342,361 |
| Duluth, Missabe & Northern Ry. | 1,981,648 | 3,408,234 | 2,883,707 | 6,442,985 | 1,537,255 | *d4,241,929* | 1,346,452 | 10,684,914 |
| Elgin, Joliet & Eastern Ry. | 661,634 | 928,388 | 724,031 | 1,029,794 | 1,113,090 | 1,506,795 | *d389,059* | *d477,001* |
| Erie System: | | | | | | | | |
| Erie R. R. | 12,699,832 | 12,523,148 | 15,073,070 | 16,719,922 | 15,674,104 | 16,188,393 | *d601,034* | 531,529 |
| New Jersey & New York R. R. | *d436,831* | *d334,357* | *d433,151* | *d328,511* | 52,748 | 52,217 | *d485,899* | *d380,728* |

* Although this railway reports a net income, it is in trusteeship.
a Does not include Gulf, Colorado & Santa Fe and Texas & New Orleans, the income items of which are included in returns made by Atchison, Topeka & Santa Fe and Southern Pacific Transportation System, respectively, in Central Western Region.
b Includes Atchison, Topeka & Santa Fe, Gulf, Colorado & Santa Fe, and Panhandle & Santa Fe.
d Deficit or other reverse items.

## Selected Income Items by Regions and Districts, Class I Steam Railways, Calendar Years 1934 and 1933—Continued

| Region and Railway | Net Railway Operating Income 1934 | Net Railway Operating Income 1933 | Total Income 1934 | Total Income 1933 | Total Deductions 1934 | Total Deductions 1933 | Net Income 1934 | Net Income 1933 |
|---|---|---|---|---|---|---|---|---|
| New York, Susquehanna & Western R. R. | $343,186 | $308,659 | $416,079 | $389,029 | $801,117 | $805,910 | d$385,038 | d$416,881 |
| Florida East Coast Ry. | 225,476 | d134,011 | 298,392 | d59,708 | 3,104,983 | 3,125,837 | d2,806,591 | d3,185,635 |
| Fort Smith & Western Ry. | d29,464 | d4,895 | d29,004 | d3,995 | 293,446 | 280,819 | d322,450 | d284,814 |
| Frisco Lines: | | | | | | | | |
| Fort Worth & Rio Grande Ry. | d269,224 | d393,536 | d265,737 | d389,862 | 140 | 1,092 | d265,877 | d390,954 |
| St. Louis-San Francisco Ry. | 2,934,814 | 3,381,153 | 3,665,046 | 4,235,150 | 13,249,036 | 13,530,854 | d9,583,990 | d9,295,704 |
| St. Louis, San Francisco & Texas Ry. | d531,632 | d354,114 | d519,713 | d342,846 | 136,867 | 149,532 | d656,580 | d492,378 |
| Georgia & Florida R. R. | d61,604 | d21,101 | d45,787 | d3,685 | 630,743 | 614,625 | d676,530 | d618,310 |
| Great Nothern Ry. | 14,101,650 | 11,810,227 | 18,939,827 | 16,967,399 | 20,014,307 | 19,885,159 | d1,074,480 | d3,187,760 |
| Green Bay & Western R. R. | 21,931 | 86,972 | 54,477 | 109,057 | 18,210 | 15,324 | 27,267 | 93,733 |
| Gulf, Mobile & Northern R. R. | 512,547 | 747,432 | 630,053 | 873,711 | 800,793 | 929,423 | d170,740 | d55,712 |
| Illinois Central System: | | | | | | | | |
| Central of Georgia Ry. | 675,683 | 636,011 | 1,092,220 | 1,067,852 | 3,699,562 | 3,737,417 | d2,607,342 | d2,669,565 |
| Gulf & Ship Island R. R. | d150,008 | d160,503 | d128,041 | d140,322 | 92,489 | 94,825 | d220,530 | d235,147 |
| Illinois Central R. R. | 12,688,092 | 15,371,241 | 15,562,163 | 18,305,271 | 16,567,771 | 16,927,397 | d1,005,608 | 1,377,874 |
| Vazoo & Mississippi Valley R. R. | 734,093 | 1,451,846 | 792,718 | 1,492,374 | 2,796,961 | 2,756,387 | d2,004,243 | d1,264,013 |
| Illinois Terminal Co. | 1,003,617 | 883,962 | 1,110,788 | 987,359 | 1,506,695 | 1,248,212 | d395,907 | d260,853 |
| Kansas City Southern | 1,291,453 | 1,161,674 | 1,947,523 | 1,694,480 | 2,956,650 | 2,939,026 | d1,009,127 | d1,244,546 |
| Kansas, Oklahoma & Gulf Ry. | 521,824 | 453,228 | 592,388 | 528,175 | 224,200 | 225,045 | 368,188 | 303,130 |
| Lake Superior & Ishpeming R. R. | 270,648 | 762,909 | 312,119 | 798,350 | 344 | 1,357 | 311,775 | 796,993 |
| Lehigh & Hudson River Ry. | 151,689 | 181,337 | 185,278 | 215,455 | 941 | 514 | 184,337 | 214,941 |
| Lehigh & New England R. R. | 761,746 | 702,257 | 789,884 | 730,789 | 427,306 | 430,451 | 362,578 | 300,338 |
| Lehigh Valley R. R. | 5,338,991 | 4,107,569 | 6,198,454 | 5,748,879 | 8,089,595 | 8,524,712 | d1,891,141 | d2,775,833 |
| Louisiana & Arkansas Ry. | 1,007,116 | 919,772 | 1,102,205 | 978,755 | 810,403 | 827,568 | 291,802 | 151,187 |
| Louisiana, Arkansas & Texas Ry. | 23,878 | d1,843 | 25,889 | 736 | 56,003 | 77,459 | d30,114 | d76,723 |
| Maine Central R. R. | 1,838,069 | 1,933,102 | 2,191,357 | 2,196,830 | 2,156,106 | 2,177,545 | 35,251 | 19,285 |
| Midland Valley R. R. | 407,353 | 414,103 | 512,754 | 523,021 | 453,135 | 465,482 | 59,619 | 57,539 |
| Minneapolis & St. Louis R. R. | 40,723 | 281,705 | 108,474 | 352,953 | 3,051,546 | 3,098,579 | d2,943,072 | d2,745,626 |
| Mississippi Central R. R. | d18,437 | d20,404 | d17,044 | d18,510 | 124,871 | 119,464 | d141,915 | d137,974 |
| Missouri & North Arkansas Ry. | 63,322 | 53,062 | 65,464 | 55,069 | 253,218 | 354,392 | d187,754 | d109,323 |
| Missouri-Kansas-Texas Lines | 1,708,707 | 2,943,744 | 2,129,916 | 3,388,054 | 4,920,552 | 4,905,052 | d2,790,636 | d1,516,998 |
| Missouri Pacific System: | | | | | | | | |
| Beaumont, Sour Lake & Western Ry. | d138,205 | d220,610 | d136,166 | d217,817 | 175,440 | 175,512 | d311,606 | d393,329 |
| International-Great Northern R. R. | 1,370,550 | 1,518,751 | 1,456,382 | 1,622,239 | 2,873,750 | 2,907,632 | d1,417,368 | d1,285,393 |
| Missouri-Illinois R. R. | 59,775 | 32,807 | 65,486 | 35,218 | 136,967 | 138,264 | d71,481 | d103,046 |
| Missouri Pacific R. R. | 6,118,046 | 6,923,548 | 7,134,608 | 8,494,106 | 21,336,426 | 21,548,583 | d14,201,818 | d13,054,477 |
| New Orleans, Texas & Mexico Ry. | 523,390 | 312,020 | 595,854 | 1,636,379 | 2,668,057 | 2,786,819 | d2,072,203 | d1,150,440 |
| St. Louis, Brownsville & Mexico Ry. | 713,990 | 605,438 | 762,989 | 697,161 | 850,552 | 858,819 | d87,563 | d161,658 |
| San Antonio, Uvalde & Gulf R. R. | 34,040 | d124,865 | 39,000 | d117,470 | 221,082 | 220,795 | d182,082 | d338,265 |
| Texas & Pacific Ry. | 4,732,752 | 3,942,553 | 5,209,474 | 4,346,014 | 4,177,530 | 4,242,256 | 1,031,944 | 103,758 |
| Monongahela Ry. | 1,066,544 | 1,166,000 | 1,079,161 | 1,216,244 | 845,958 | 897,913 | 233,203 | 318,331 |
| Montour R. R. | 774,331 | 722,516 | 847,922 | 822,226 | 88,792 | 92,418 | 759,130 | 729,808 |
| Nevada Northern Ry. | 36,401 | d36,496 | 62,051 | d21,024 | 617 | 645 | 61,434 | d21,669 |
| New Haven System: | | | | | | | | |
| New York, New Haven & Hartford R. R. | 5,617,020 | 7,695,427 | 12,948,441 | 13,875,385 | 18,480,555 | 18,729,217 | d5,532,114 | d4,853,832 |
| New York, Ontario & Western Ry. | 1,252,077 | 1,708,812 | 1,496,541 | 1,961,342 | 1,574,961 | 1,588,759 | d78,420 | 372,583 |
| New York Central Lines: | | | | | | | | |
| New York Central R. R. | 29,160,928 | 33,269,162 | 52,577,534 | 54,791,300 | 60,259,869 | 60,203,814 | d7,682,335 | d5,412,514 |
| Pittsburgh & Lake Erie R. R. | 3,304,833 | 2,906,119 | 3,997,270 | 3,856,385 | 1,076,108 | 1,291,135 | 2,921,162 | 2,565,250 |
| New York, Chicago & St. Louis R. R. | 5,509,427 | 5,216,887 | 7,588,976 | 6,638,848 | 7,530,342 | 7,844,484 | 58,634 | d1,205,636 |
| New York Connecting R. R. | 1,263,624 | 1,261,009 | 1,316,741 | 1,332,891 | 1,321,737 | 1,321,016 | d4,996 | 11,875 |
| Norfolk & Western Ry. | 22,518,286 | 24,656,354 | 24,257,065 | 26,620,348 | 3,792,572 | 4,140,939 | 20,464,493 | 22,479,409 |
| Norfolk Southern R. R. | 489,653 | 303,231 | 655,479 | 484,301 | 991,414 | 1,006,415 | d335,935 | d522,114 |
| Northern Pacific Ry. | 7,915,209 | 5,975,973 | 15,452,756 | 14,868,882 | 14,553,349 | 14,564,901 | 899,407 | 303,981 |
| Oklahoma City-Ada-Atoka Ry. | d10,377 | d21,665 | d7,212 | d19,071 | 81,438 | 89,569 | d88,650 | d108,640 |
| Pennsylvania System: | | | | | | | | |
| Long Island R. R. | 2,372,922 | 4,230,658 | 2,878,141 | 4,784,277 | 2,548,689 | 2,541,019 | 329,452 | 2,243,258 |
| Pennsylvania R. R. | 61,317,016 | 61,976,859 | 101,330,907 | 103,596,458 | 82,515,214 | 84,315,288 | 18,815,693 | 19,281,170 |
| Pennsylvania-Reading Seashore Lines | d1,024,913 | d1,504,069 | d1,673,431 | d1,362,870 | 1,195,718 | 636,772 | d2,871,149 | d1,999,642 |
| Pere Marquette Ry. | 2,618,368 | 1,724,456 | 3,038,858 | 2,166,153 | 3,650,985 | 3,765,624 | d612,127 | d1,599,471 |
| Pittsburg & Shawmut R. R | 94,516 | 126,744 | 130,193 | 268,785 | 123,011 | 124,172 | 7,182 | 144,613 |
| Pittsburgh & West Virginia Ry. | 835,969 | 904,838 | 850,859 | 919,457 | 943,130 | 1,025,564 | d92,271 | d106,107 |
| Pittsburg, Shawmut & Northern R. R. | d57,694 | 90,624 | d42,263 | 101,793 | 128,108 | 128,619 | d170,371 | d26,826 |
| Reading System: | | | | | | | | |
| Central R. R. of New Jersey | 3,060,753 | 2,253,768 | 4,098,577 | 3,449,971 | 5,634,647 | 5,759,709 | d1,536,070 | d2,309,738 |
| Reading Co. | 12,856,973 | 13,577,068 | 15,217,276 | 16,352,782 | 9,535,222 | 9,637,259 | 5,682,054 | 6,715,523 |
| Richmond, Fredericksburg & Potomac R. R. | 443,987 | 393,220 | 655,390 | 646,640 | 331,119 | 354,320 | 324,271 | 292,320 |
| Rock Island System: | | | | | | | | |
| Chicago, Rock Island & Gulf Ry. | d48,845 | d291,715 | 56,806 | d169,086 | 1,424,510 | 1,434,966 | d1,367,704 | d1,604,052 |
| Chicago, Rock Island & Pacific Ry. | 1,727,645 | 3,289,282 | 2,382,518 | 4,766,317 | 14,326,215 | 14,765,111 | d11,943,697 | d9,998,794 |
| Rutland R. R. | d13,810 | 286,750 | 47,547 | 355,109 | 422,649 | 425,437 | d375,102 | d70,328 |
| Seaboard Air Line Ry. | 1,631,913 | 2,622,093 | 2,023,132 | 3,096,876 | 10,052,685 | 9,627,380 | d8,029,553 | d6,530,504 |
| Southern System: | | | | | | | | |
| Alabama Great Southern R. R. | 661,908 | 661,537 | 1,039,560 | 997,049 | 491,865 | 512,583 | 547,695 | 484,466 |
| Cincinnati, New Orleans & Texas Pacific Ry. | 3,257,307 | 3,354,223 | 3,384,902 | 3,591,392 | 1,751,623 | 1,728,219 | 1,633,279 | 1,863,173 |
| Georgia Southern & Florida Ry. | 115,244 | 38,440 | 121,828 | 48,191 | 322,550 | 325,477 | d200,722 | d277,286 |
| Mobile & Ohio R. R. | d30,048 | 177,587 | 28,071 | 263,821 | 1,732,292 | 1,813,713 | d1,704,221 | d1,549,892 |
| New Orleans & Northeastern R. R. | 81,609 | d182,615 | 109,586 | d146,077 | 397,293 | 398,442 | d287,707 | d544,519 |
| Northern Alabama Ry. | 41,761 | 8,708 | 42,479 | 9,485 | 109,452 | 109,610 | d66,973 | d100,125 |
| Southern Ry. | 12,665,357 | 15,015,944 | 14,441,048 | 16,938,361 | 17,214,184 | 17,648,681 | d2,773,136 | d710,320 |
| Southern Pacific System: | | | | | | | | |
| Northwestern Pacific R. R. | d8,010 | d180,606 | 23,382 | d149,740 | 1,463,506 | 1,474,755 | d1,440,124 | d1,624,504 |
| St. Louis Southwestern Lines f | 1,958,645 | 1,789,740 | 2,045,582 | 1,869,142 | 3,191,019 | 3,406,036 | d1,145,437 | d1,536,804 |
| San Diego & Arizona Eastern Ry. | d74,229 | d61,046 | d35,620 | d30,301 | 61,173 | 112,733 | d96,793 | d143,124 |
| Southern Pacific Transportation System g | 17,003,658 | 9,057,074 | 32,777,279 | 27,455,987 | 32,369,054 | 32,446,918 | 408,225 | d4,990,931 |
| Spokane, Portland & Seattle Ry. | 1,540,712 | 1,207,741 | 1,684,052 | 1,304,471 | 3,669,300 | 3,639,374 | d1,985,248 | d2,334,903 |
| Tennessee Central Ry. | 335,407 | 266,299 | 344,544 | 275,025 | 306,281 | 312,577 | 38,263 | d37,552 |
| Texas Mexican Ry. | 144,796 | d116,150 | 155,728 | d105,088 | 181,583 | 182,398 | d25,855 | d287,486 |
| Toledo, Peoria & Western R. R. | 138,055 | 185,841 | 153,618 | 198,862 | 80,801 | 78,572 | 72,817 | 120,290 |
| Union Pacific System: | | | | | | | | |
| Los Angeles & Salt Lake R. R. | 3,061,840 | 1,591,090 | 3,146,517 | 1,759,950 | 2,678,467 | 2,745,382 | 468,050 | d985,432 |
| Oregon Short Line R. R. | 3,248,961 | 3,301,980 | 4,883,366 | 4,713,983 | 3,566,916 | 3,625,701 | 1,316,450 | 1,088,282 |
| Oregon-Washington R. R. & Navigation Co. | 548,056 | d302,844 | 1,037,907 | 114,958 | 3,926,417 | 3,890,762 | d2,888,510 | d3,775,804 |
| St. Joseph & Grand Island Ry. | 528,350 | 621,493 | 622,049 | 713,376 | 169,415 | 182,608 | 452,634 | 530,768 |
| Union Pacific R. R. | 11,585,526 | 14,246,901 | 30,118,258 | 35,627,038 | 10,366,899 | 10,444,754 | 19,751,359 | 25,182,284 |
| Utah Ry. | d35,184 | 61,314 | d22,396 | 82,557 | 226,138 | 226,650 | d248,534 | d144,093 |
| Virginian Ry. | 6,772,558 | 6,116,664 | 7,814,985 | 7,192,967 | 4,240,545 | 4,236,315 | 3,574,440 | 2,956,652 |
| Wabash System: | | | | | | | | |
| Ann Arbor R. R. | 374,659 | 220,246 | 393,309 | 234,427 | 445,597 | 460,459 | d52,288 | d226,032 |
| Wabash Ry. | 4,355,273 | 2,745,490 | 4,724,505 | 3,268,913 | 7,832,126 | 8,091,971 | d3,107,621 | d4,823,058 |
| Western Maryland Ry. | 4,106,178 | 4,060,202 | 4,275,956 | 4,213,801 | 3,280,701 | 3,277,750 | 995,255 | 936,051 |
| Western Pacific R. R. | 1,267,422 | 905,827 | 2,049,102 | 1,664,026 | 3,648,569 | 3,751,834 | d1,599,467 | d2,087,808 |
| Wheeling & Lake Erie Ry. | 1,764,829 | 1,651,357 | 1,904,446 | 1,824,971 | 706,897 | 759,921 | 1,197,549 | 1,065,050 |
| Wichita Falls & Southern R. R. | 47,951 | 100,487 | 162,004 | 214,154 | 252,093 | 258,919 | d90,089 | d44,765 |

d Deficit or other reverse items.
f Includes St. Louis Southwestern Ry. and St. Louis Southwestern Ry. of Texas.
g Includes Southern Pacific Company and Texas & New Orleans R. R.

# Hearings on Water Carrier Bill

## Regulation of water transportation favored and opposed before senate committee

WASHINGTON, D. C.

ACTIVITY with respect to the Eastman program of transportation legislation was halted this week while the Senate committee on interstate commerce turned its attention to the question of a sweeping investigation of railroad management and finance. Hearings on the water carrier regulation bill, begun on March 11, were concluded on March 19 and on the following day the committee began public hearings on S. Res. 71, the resolution introduced in the Senate by Chairman Wheeler on February 4, without making any announcement as to its intentions regarding the bill providing for a reorganization of the Interstate Commerce Commission and for a permanent Co-ordinator of Transportation. It is understood that the question of hearings on this bill depend on the disposition to be made of the others.

When the hearings were started on February 25 it was announced that they would be devoted to three bills, S. 1629, the motor carrier bill, on which testimony was closed on March 8, S. 1632, the water carrier bill, and S. 1635, the commission bill, and Mr. Eastman's opening statement was devoted to all three. Some of the other witnesses have also commented to some extent on all three. Chairman Wheeler has also again announced his intention of introducing his promised government ownership bill at an early date, although he said he did not expect it to get far at this session.

In the House a sub-committee of the committee on interstate and foreign commerce has completed hearings on the motor carrier bill and is now to consider the various proposed amendments to it in executive session, but the merchant marine committee, to which the water carrier bill was transferred, has begun hearings on other proposed legislation dealing with safety measures and subsidies for the merchant marine.

As an indication that Congress and the Administration are finding their attention fully occupied with numerous other controversial subjects. President Roosevelt has for some time refrained from making further predictions regarding his long-promised message to Congress on co-ordinated transportation regulation and has declined to say what will be the subject of his next message. At one time he announced that the transportation message would follow shortly after the ship subsidy recommendation which he sent to Congress on March 7, but the next was devoted to holding company legislation and he has referred to possible messages on about four other subjects. The President indicated at a recent press conference, however, that the filling of the vacancy on the Interstate Commerce Commission caused by the expiration of the term of Commissioner P. J. Farrell might await the new set-up of the commission.

### Chairman Wheeler Sees Need for Regulation

Chairman Wheeler has repeatedly expressed himself throughout the hearings as to the necessity for co-ordinated regulation of the various forms of transportation, unless regulation of the railroads is to be relaxed, and has said that if that should come to pass the railroads would be able to put their competitors out of business. He has also spoken several times as if the committee intended to report a bill or bills, although his remarks during the questioning of witnesses have usually been critical of both the railroads and the Interstate Commerce Commission. The attendance of Senators has been so small however, that there has been little indication as to what might be the attitude of the committee as a whole. Some members of the merchant marine sub-committee of the commerce committee have attended with the members of the interstate commerce committee, but the number of Senators present has generally ranged from two to seven. Some members of the committees are trying to pay attention to two or three hearings going on simultaneously.

There has been a great deal of testimony both for and against the bill. There has been strong support from the railroads and representatives of common carrier water operators on the Mississippi river system and in the intercoastal trade who are tired of cut-throat competition and desire regulation as a stabilizing influence. Testimony on behalf of shippers has been divided. Representatives of users of "cheap" water transportation on the inland waterways have opposed regulation on the ground that it would tend to increase rates and there has been much testimony to the effect that the provisions of the bill would prove unworkable or would be unduly restrictive as to contract and private carriers, which represent so large a proportion of the existing transportation by water.

Objections have been made particularly to the provisions for revocation of certificates of public convenience and necessity by the commission, or those which would authorize the commission to attach conditions in granting certificates; to the commodities clause, which would give the commission power to determine whether industries could continue to operate ships or barges, and to the regulation of wharfingers. Many objections were also offered to the sections of the bill relating to foreign commerce, although they merely represent a transfer to the Interstate Commerce Commission of powers now vested in the Shipping Board Bureau by the merchant marine act. Several witnesses have contended that if several forms of transportation are regulated by one commission some are liable to be subordinated to others, unless some formula is prescribed to require regulation on the basis of cost.

### Railroads Support Eastman Bill

Testimony on behalf of the railroads was given on March 18 by Joseph G. Kerr, assistant to the vice-president in charge of the Traffic Department of the Association of American Railroads. He said the railroads favor the bill as it is written with the exception that they would prefer that the prescription of joint rates between railroads and trucks or water lines be made permissive rather than mandatory. He said in part:

> In approaching this problem, we do so in full recognition of the fact that the motor and water transportation competitors are here to stay and, where economically justified, have a place in the transportation system of this country as surely as have the railroads.
>
> It is a matter of common knowledge that the railroads no longer have any monopoly, if they ever had, upon the transportation business of this country. That fact is beyond dispute if we

accept as correct the Co-ordinator's estimate that in 1932 the steam railroads handled but 53.9 per cent of the total tons of freight transported as contrasted with 15.1 per cent carried on the Great Lakes and inland waterways and 23.8 per cent by the inter-city trucks. If the coastwise and intercoastal traffic competitive with the railroads had been taken into account, the proportion carried by the railroads would probably have been less than 53.9 per cent. While it is true that in respect of ton-mileage the railroad percentage is much greater than 53.9, it must be borne in mind that this includes a substantial amount of long-haul tonnage which while competitive with both truck and water lines is generally beyond the active range of truck operations as to much of the traffic. Within this active area, itself very large, it would seem that, from the standpoint of both tons originated and ton-miles, the respective percentages enjoyed by the railroads would be less than as estimated by the Co-ordinator for the whole country.

In general, I may say that I believe no fair-minded person can take very great exception to the statements of the Co-ordinator regarding this general water subject as appearing under the topic of "Regulation of Other Carriers" of his recent report, especially when he said that: "If the principles of a battle royal are to govern, it is unfair to handcuff the railroads." The railroads for whom I speak have no desire to engage in a "battle royal," even though many of our competitors have for some years been engaged in such competition.

Each class or type of water service is generally competitive in whole or in part with the railroads. The latter are regulated in the most minute detail, while their water competitors, excluding those owned or controlled by railroads, are practically free from any regulation or restraint except where they join in through routes and joint rates with the railroads, but only as to such traffic. But even this has become almost a farce because of the rather general practice of water lines, particularly on the Great Lakes and inland waterways, of making any rate they see fit from day to day or for particular shippers and not for others, between their ports of call, which when added to charges of motor trucks will produce a desired total charge from origin to destination, even though such charge absolutely defeats that maintained by the same water line jointly with the railroad and on file with the Interstate Commerce Commission and which must be adhered to under heavy penalty.

Allowances are being made by water lines to shippers for trucking to or from the river ports in the shippers' own trucks, regardless of the actual cost to the shipper. The business of that particular shipper is thus practically bought by the water carrier. It is something that the railroads cannot do under the Interstate Commerce Act and very properly so, but the fact remains that the railroad is effectively eliminated from the field of competition and competing shippers may be placed at a disadvantage. Such a competing shipper now has no remedy to bring about a correction of such discrimination.

The inland water lines are not compelled to publish, to file with anybody, or to maintain, any particular port-to-port rate, any joint rate or arrangement with a motor truck line, including the shippers' own trucks, or the allowance made out of the port-to-port rates for trucking or storage. As indicated, these rates or allowances may be carried in a letter, be conveyed by word of mouth, and may vary from day to day, or as between individual shippers. No one but the particular water line knows what is being charged and even one water line does not always know what its competitor is doing. Certain it is that the railroads are left to guess what is being charged by these water competitors.

Many shippers are located at inland points and cannot effectively use water transportation. They are dependent upon rail transportation and to some extent the motor trucks. Is it fair to them, as a part of the general public, that water lines operating largely upon highways improved and maintained at heavy public expense, should through the absence of adequate regulation, be permitted to continue discriminatory practices without recourse of such interior shippers to any public tribunal? The very fact that they are the beneficiaries of these enormous subsidies would seem to justify regulation in order that other groups of citizens and taxpayers may not be discriminated against.

The Interstate Commerce Commission, under the inland waterways corporation act as amended, commonly known as the Denison act, is required to establish upon request of certificated lines operating on the inland waterways, through routes and joint rates, minimum differentials under the all-rail rates, and divisions, with the railroads and the latter are compelled to join therein, even though the particular railroad serves the origin and destination with its own rails and it is thus short-hauled; and yet, the commission is given no control over other operations of the same water line, who may defeat through devious devices the very things that the commission is required to give them in connection with the railroads.

Right now the commission is engaged, as a result of complaints of both water lines and railroads, in a general investigation of through rates and joint rates and differentials between the inland water carriers and the railroads. No one knows and no one can find out, except the particular barge line and the recipient of the favor, exactly what is going on. The commission is badly handicapped in its regulation of the all-rail rates and the joint water-rail rates by reason of its lack of this knowledge and its inability to get it. Even in cases where the water lines have invoked and are invoking the aid of the commission against the railroads, many of them are reluctant to furnish and may absolutely refuse to furnish information as to their charges.

There is not the slightest doubt but that all of this has resulted in a most chaotic situation, has depressed the charges of both rail and water lines in many instances below reasonable levels, and without any real benefit to the general public. True it is that particular or favored shippers, sometimes particular boat lines and localities, may have reaped some temporary benefit, but if it keeps up, it may mean the destruction of the railroads and the water lines themselves through a depletion of revenues to a state of exhaustion.

It is particularly burdensome in the interior because the inland waterways are not generally natural waterways, but must be and are constructed and maintained at heavy public expense, and, further, because of the case of entering such a service, the water lines very largely operating free from taxation other than Federal income taxes, sometimes paid by other than the federally-owned barge line, and on basis of low average wage scales. It may be said as to the latter that the three large barge operators on the Mississippi, Warrior and Ohio rivers averaged 38 cents per hour in 1933, as contrasted with an average wage of 59½ cents per hour paid by the Class I railroads. The selfish interest of a few favored localities should not, we feel, be permitted to becloud the issue.

## Railroads Neutral As To I.C.C. Reorganization

While the association and the carriers generally take a neutral position in respect of the reorganization of the commission, they do take the stand that the Interstate Commerce Commission, however organized, should have jurisdiction over the water and motor carriers as well as the rail carriers. The rail, water and truck operations interlock to such an extent that we believe a single commission provides the practical method of regulation.

Section 500 of the transportation act declares it to be the policy of Congress to promote, encourage, and develop water transportation and to preserve in full vigor both rail and water transportation. The commission now has power to prescribe maximum rail and water rates and minimum differentials. The water carriers proposed to be regulated, except those in foreign service, operate almost invariably between the same points as the rail lines. The question may reasonably be asked how is the commission going to effectively regulate the all-rail and rail-water rates if the all-water service is to be regulated by a separate body?

It has been said in some circles that the railroads in supporting the proposed water carrier bill will be given an opportunity to throttle the water carriers. Nothing could be further from the truth. The railroads are pretty well in a strait-jacket when it comes to anything like that. The commission not only has the power to suspend any rate the railroad might publish, but to prescribe minimum rates. It has frequently exercised both of these powers against the rail lines in efforts of the latter to meet legitimate water competition. The real truth is that, unless the proposed bill in substantially its present form is adopted, the water carriers will eventually throttle themselves with their cut-throat methods and may carry the railroads down with them.

There can be but little question but that the wharfingers should be regulated in the public interest. Where the railroad operates as a wharfinger, it must file its schedules with the commission and maintain them, but this is not true as to the private operator.

A port is merely a gateway through which export, import, coastwise, and intercoastal traffic must move to and from interior points in the United States. Generally speaking, one port is competitive with other ports, usually many ports, in the movement of such traffic to or from the same interior point or to or from interior points competitive therewith. It is therefore apparent that discriminatory practices on the part of wharfingers at one port may seriously react to the disadvantage of the general public.

Not only should the common carrier water line be regulated in the same manner as its rail competitor, but such common water carrier should have protection against the contract and private water carriers. Much of the trouble of the present and recent past is and has been due to the practices of these private and contract carriers. Certain water carriers perform a mixture of common carrier and contract carrier service, thus enabling them to pick and choose and operate generally to the disadvantage of the legitimate common carrier line taking practically all business as it is offered, serving all of the public alike, and usually operat-

ing under published and maintained rates and according to regular schedules.

Likewise, the so-called private water operator should be limited, generally, to the carriage of goods of its owner, and should not be permitted to raid the traffic of legitimate common and contract water operators by picking up and carrying return loads at absurdly low charges.

Congress long ago recognized the unwisdom of permitting railroads to build new lines or to extend their lines into territories already adequately served. No such restriction is present with water carriers. Regardless of the amount of tonnage reasonably to be expected or the number of water carriers already competing for the available traffic, there is nothing to prevent a new water carrier entering the field, nor to shift its service from one section to another. There have been numerous instances of this kind. This is a very easy thing for a water carrier to do with a public water-way already provided, and, as already indicated, practically free from ordinary taxation and operating on basis of relatively low wage scales. While a difficult matter to prove, it is my firm conviction that such cut-throat competition with resultant exhaustion, coupled with obsolete equipment, had far more to do with the virtual disappearance several decades ago of water carriers from the inland waterways than the alleged ruthless rate-cutting methods of the railroads. Manifestly, if it is to the best interests of the country that railroads should not extend lines into territories already adequately served, then water lines should not be permitted to enter services already fully tonnaged by the existing water carriers.

In concluding I may say that the reason for the passage of the original Interstate Commerce Act regulating the railroads was the discriminatory practices then engaged in under which the same charges were not made to all alike under similar circumstances and conditions, resulting in much dissatisfaction and complaint. Other forms of transportation are now very active in the field competing for the available traffic along with the railroads between the same points as are served by the railroads, but these other forms are practically free from any regulative restrictions such as face the railroads and certainly do not have to contend with the same capital and tax burdens as the railroads. They are free to and do indulge in all of the discriminatory practices for which the railroads were long ago condemned, no longer permitted as to the railroads, and very properly so. It can hardly be said to be in the public interest if other forms of transportation are permitted to discriminate in their charges, pay rebates and the like, or to engage in raids upon the business of legitimate operators in order to obtain some transient advantage.

If it were not for one paragraph in Section 204 relating to foreign trade shipping, Mr. Kerr said, he did not believe he would advocate the rest of the section but that would authorize the commission to make rules and regulations affecting shipping in foreign trade to meet the conditions of competitive methods and practices. If properly administered that would meet many of the objections made, he said, but somebody ought to prevent discrimination between ports. A member of the committee pointed out that the section applying to foreign trade is identical with section 19 of the merchant marine act.

In reply to questions Mr. Kerr said that much of the Shipping Board regulation is ineffective, as well as that provided by the N.R.A. code for canal carriers.

After Mr. Kerr had described some of the rate-cutting, particularly on sugar, by operators on the Hudson river, the New York Barge canal and the Great Lakes, Senator Copeland asked if regulation would put such operators out of business. Mr. Kerr said he did not think so because they are now making rates inexcusably low and losing money on the traffic. He pointed out that the low rates are in part made possible by government subsidies and he quoted from the report of the Mississippi Valley Committee which said that the subsidies amounted to as much as 9 mills per mile on the Lower Mississippi river and 5 mills on the Ohio. He also gave figures showing that the state of New York could have paid rail rates for every pound of freight moved over its Barge Canal for less than it has expended for the construction and operation of the canal.

Mr. Kerr also replied to some of the statements made by General Ashburn and other waterway witnesses, some of whom, he said, had complained of rate reductions made by the railroads when the rate-cutting had been initiated by them. He said they had sought to give the committee the impression that the commission has already largely nullified the long-and-short-haul clause by granting applications made by the railroads for relief orders but that even when the commission does grant fourth-section relief it often does not allow rates as low as those proposed by the roads and he pointed out that the railroads are still complaining of the administration of the law by the commission and are asking to have it repealed.

S. Abbott Maginnis, appearing on behalf of the American Short Line Railroad Association, supported the bill with the exception of the commodities clause.

### Gen. Ashburn Urges Regulation

Maj. Gen. Thomas Q. Ashburn, president of the Inland Waterways Corporation, urged enactment of both the bill for the regulation of water carriers and that for the reorganization of the Interstate Commerce Commission. He criticized both the railroads and the present commission but said that with the new declaration of policy in the Eastman Bill the commission "properly reorganized and with new blood" would be charged with the duty of protecting the public. He said the Inland Waterways Corporation was the only agency in the United States trying to find the "true costs of transportation." He also said that all carriers are now suffering from lack of regulation and that he wished he had it in his power to impress the committee with the gravity of the situation and the necessity for the enactment of the bills.

L. W. Childress, president of the Mississippi Valley Barge Line, testified in support of the bill and a policy of regulation, complaining of the rate-cutting practices of the railroads.

R. C. Narelle, for the Canal Carriers' Association, opposed the bill and offered several suggestions for amendments. He favored a minimum of regulation for the water lines and said the bill contained many provisions from the interstate commerce act inapplicable to them.

Other testimony in support of the bill was given by J. A. Crothers, of the Association of Marine Terminal Operators, Atlantic Ports; S. P. Gaillard, of the Alabama State Docks Commission; and J. A. Coates, of the Eastern Steamship Lines, Inc. Edward Hinman, for the Warehousemen's Association of the State of New York, approved the basic principles of the bill but opposed provisions relating to wharfingers. Opposition to the bill was expressed by John McKay, general manager for the Board of Commissioners of the Port of New Orleans, and Rene A. Stiegler, general agent of the board, F. W. S. Locke, vice-president of the Nelson Steamship Company, J. B. McGinnis, of the Memphis Harbor Commission, and A. P. Fant, of the Memphis Chamber of Commerce.

A statement favoring reasonable regulation of water and motor carriers engaged in interstate commerce was placed before the committee by H. I. Harriman, president of the Chamber of Commerce of the United States. He said the bills contain numerous details on which it would be impracticable to obtain detailed expressions by the chamber's membership.

F. S. Keiser, traffic commissioner of the Duluth Chamber of Commerce, appearing as chairman of the inland waterway committee of the National Industrial Traffic League, said the league was opposed to any bill "that tends in any manner to increase existing legislation against water transportation." He said that regulation would mean only higher transportation charges.

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# Freight Car Loading

WASHINGTON, D. C.

REVENUE freight car loading in the week ended March 9 totaled 587,270 cars, a decrease of 17,372 cars as compared with the preceding week and of 26,850 cars as compared with the corresponding week of last year. This was, however, an increase of 145,909 cars as compared with 1933. The principal decrease was in the loading of coal but miscellaneous freight, forest products and ore showed increases as compared with the corresponding week of last year. The summary, as compiled by the Car Service Division of the Association of American Railroads, follows:

**Revenue Freight Car Loading**

For Week Ended Saturday, March 9

| Districts | 1935 | 1934 | 1933 |
|---|---|---|---|
| Eastern | 135,883 | 150,396 | 104,897 |
| Allegheny | 118,090 | 127,323 | 85,790 |
| Pocahontas | 46,884 | 45,583 | 30,816 |
| Southern | 91,591 | 94,246 | 70,517 |
| Northwestern | 66,563 | 66,337 | 47,348 |
| Central Western | 81,705 | 82,380 | 64,245 |
| Southwestern | 46,554 | 47,855 | 37,748 |
| Total Western Districts | 194,822 | 196,572 | 149,341 |
| Total All Roads | 587,270 | 614,120 | 441,361 |
| Commodities | | | |
| Grain and Grain Products | 26,981 | 29,767 | 18,214 |
| Live Stock | 11,683 | 11,991 | 10,818 |
| Coal | 130,074 | 152,841 | 96,872 |
| Coke | 6,945 | 10,094 | 4,729 |
| Forest Products | 24,410 | 23,001 | 13,429 |
| Ore | 3,411 | 3,393 | 1,794 |
| Merchandise L.C.L. | 160,513 | 166,426 | 154,654 |
| Miscellaneous | 223,253 | 216,607 | 140,851 |
| March 9 | 587,270 | 614,120 | 441,361 |
| March 2 | 604,642 | 605,717 | 481,208 |
| February 23 | 552,896 | 574,908 | 462,315 |
| February 16 | 581,981 | 600,268 | 517,529 |
| February 9 | 592,560 | 573,898 | 504,663 |
| Cumulative Total, 10 Weeks | 5,687,984 | 5,717,393 | 4,817,343 |

## Car Loading in Canada

Car loadings in Canada for the week ended March 9 totaled 41,823 compared with 43,494 cars last year and 44,034 cars for the previous week, according to the Dominion Bureau of Statistics.

| | Total Cars Loaded | Total Cars Rec'd from Connections |
|---|---|---|
| Total for Canada: | | |
| March 9, 1935 | 41,823 | 24,168 |
| March 2, 1935 | 44,034 | 23,555 |
| February 23, 1935 | 45,012 | 23,769 |
| March 10, 1934 | 43,494 | 26,023 |
| Cumulative Totals for Canada: | | |
| March 9, 1935 | 424,974 | 224,594 |
| March 10, 1934 | 405,354 | 222,434 |
| March 11, 1933 | 324,797 | 170,932 |

# Investigation of Railroad Financing Proposed

WASHINGTON, D. C.

THE Senate committee on interstate commerce on March 20 began a hearing on the resolution introduced in the Senate on February 4 by Senator Burton K. Wheeler, of Montana, chairman of the committee, proposing a "thorough and complete investigation" of practically every phase of railroad financing and an appropriation of $10,000 for the purpose. The first witness called was Charles A. Beard, chairman of an independent committee of Missouri Pacific bondholders that has recently been demanding an investigation of matters pertaining to the proposed reorganization of the Missouri Pacific and which has asked that conferences held by the Reconstruction Finance Corporation with representatives of the road be made public. Dr. Beard read a lengthy prepared statement citing details of numerous recent examples of alleged railroad financial mismanagement which have been made public through Interstate Commerce Commission investigations and in court proceedings and urged the importance of a more complete investigation of these cases and other possible similar examples as necessary to restore the confidence of investors in railroad securities, saying that "so long as American investors feel that they are deprived of redress for the wrongs inflicted on them, and so long as they feel that nothing substantial has been done to prevent the return of the railroads to men of the same type as those who have mishandled the roads in the past, just so long is the confidence of American investors going to remain impaired." Much of his statement dealt with "banker control" of the railroads and he said that "in 1935, the sixth year of the depression, the bankers are seated firmly in the railroad saddle, controlling the railroads that are not in bankruptcy and seeking to be master of the reorganization of those roads that are in bankruptcy." He took the position that the Interstate Commerce Commission and the Reconstruction Finance Corporation are not in a position to obtain the complete facts and are subject to restrictions that would not limit the Senate committee.

Eleven Senators attended the first session, which was to be followed by testimony of other witnesses along the same line, although only about half that many members of the committee had attended hearings on the bills recommended by Co-ordinator Eastman as a result of his million-dollar investigation of the railroads and the transportation situation. At the outset, Senator Dieterich, of Illinois, protested against the idea of calling "partisan" witnesses first, saying he had understood it was proposed to call first officials of government agencies to testify as to whether there was a need for such an investigation, and asking whether the investigation was to be conducted at these hearings without waiting for the Senate to adopt the resolution. Senator Wheeler said it was not but that some preliminary witnesses would be called to show the need for the passage of the resolution, and that he happened to know that the I. C. C. and the R. F. C. have not all the information. Senator White, of Maine, asked if the subjects being discussed by the witness were not in litigation. Dr. Beard replied that some of them were. Senator Minton, of Indiana, asked if he thought the entire railroad situation of the country should be made subject to investigation. Dr. Beard replied that the committee ought to have the power to go into the entire situation if necessary but that it would not be necessary to bother the sound railroads and Senator Wheeler said there ought to be a little faith in the committee that it would try to "go only into the crooked things." Dr. Beard said in part:

> Your committee is being asked to recommend to the United States Senate a resolution for the production of the truth about the railroads of this country. The truth about this backbone industry is necessary if we are to lay sound foundations for substantial recovery from the depression.
>
> There are of course many aspects of the general problem which this committee may want to consider. One of them in and of itself makes essential the adoption of the resolution now pending before you for a thorough inquiry into the railroads. This aspect relates to the financing and financial control of the railroads, and most deeply concerns the owners of the roads.
>
> The protection of these investments made by most of the people of the United States requires, among other things, a restoration of the confidence of American investors in the management and control of American railroads. This is necessary because the railroads, now confronted with the intense

(*Continued on page 466*)

# Insuring Safety of High Speed Trains

## Three speakers at Western Railway Club meeting review demands that faster schedules imposed on tracks, signals and brake equipment

WHAT the operation of the new higher speed trains means in the construction and maintenance of tracks, in the design of signal systems, and in the more exacting demands imposed on brake equipment was the subject of discussion at the meeting of the Western Railway Club at the Hotel Sherman, Chicago, on March 18. The subject was introduced by Elmer T. Howson, vice-president and western editor of the *Railway Age,* who reviewed the progress in the stepping up of train speeds during the last 12 months and discussed the refinements in track maintenance that the faster schedules imposed. W. F. Zane, signal engineer, Chicago, Burlington & Quincy, outlined the more exacting requirements for adequate signaling protection. J. C. McCune, assistant director of engineering, Westinghouse Airbrake Company, described the tests made with the Burlington's Zephyr for the purpose of establishing the various constants affecting brake operation at speeds appreciably in excess of those for which these values had been previously known. He also presented a number of conclusions, based on these studies, concerning the rates of retardation that may be obtained in the practical operation of the new high speed trains. Abstracts of these papers are presented below.

## The Beginning of a New Era

**By Elmer T. Howson**
Vice-President and Western Editor, Railway Age

Speed is a characteristic of the age through which we are passing. Whether we like it or not, we cannot ignore the trend. Nowhere are the demands for speed more pressing than in transportation.

It is for this reason that the past year has been so momentous for the railway industry. After years of more or less prosaic operation along established lines, the railways have suddenly recaptured public interest. Orders for new trains of new and novel designs have followed one another in rapid succession, while records for speeds have been broken so frequently and in so many parts of the country as to demonstrate that we are in the beginning of a new era of speeds in regular routine operation that were unthought of as recently as two years ago.

### Records Broken

It is less than 10 months ago—May 26, 1934, to be exact—that the Burlington's Diesel-powered Zephyr traversed the 1,015 miles from Denver, Colo., to Chicago non-stop in 13 hr. 5 min., an average speed for the entire distance of 77.5 miles per hour, with a speed of more than 100 miles per hour for 19 miles and a maximum speed of 112.5 miles per hour. This was a reduction of 5 hr. 48 min., or 30 per cent, from the previous record between these points, which had stood since 1897. It compares with a regular schedule of 26 hr. 15 min.

Less than two months later, on July 20, the Milwaukee established a new record for sustained speed by a steam train when it operated a train in regular service for the 85 miles between Chicago and Milwaukee, Wis., in 67 min. 35 sec., or at an average speed for the entire distance of 75.5 miles per hour. On this run, a speed of 91.1 miles per hour was maintained for the 69.9 miles from Mayfair, Ill., to Lake, Wis., and a speed of 93 miles per hour for the 31 miles from Russell, Ill., to Lake, while the last five miles into Lake were traversed at a speed of 103 miles per hour. This record of 67½ min. compares with a scheduled time a year ago of 110 min., since reduced to 80 min.

Then in October the Union Pacific established another world record when its six-car Diesel-powered train traveled the 2,298 miles from Los Angeles, Cal., to Chicago in 38 hr. 49 min., an average speed of 59.2 miles per hour, and the 3,258 miles from Los Angeles to New York in 56 hr. 55 min., an average speed across the continent of 57.2 miles per hour. On this run, the 508 miles between Cheyenne, Wyo., and Omaha, Neb., were covered at the rate of 84 miles per hour, while a maximum speed of 120 miles per hour was attained at one point. This record of 38 hr. 47 min. from Los Angeles to Chicago compares with the best previous record of 44 hr. 55 min., made by "Death Valley" Scott in 1905, while the 56 hr. 58 min. record to New York compares with the fastest previous run of 72 hr. 27 min., made by E. H. Harriman in 1906—reductions of 6 hr. 7 min. and 15 hr. 32 min., respectively.

Still another record was broken on the Atlantic seaboard within the last month when the Pennsylvania handled President Roosevelt's special train over its newly electrified line between Washington and New York—a distance of 226 miles—in 173 min., an average speed of 78 miles per hour. This supplanted the fastest previous record, made in June, 1927, with a two-car steam-operated train carrying news reels of the Lindberg reception.

### In Actual Service

Nor have the developments of the past year been confined to demonstration runs. On November 11, the Burlington placed its Zephyr in regular service between Kansas City, Mo., Omaha, Neb., and Lincoln on a schedule of 5½ hr., which, with stops, requires operation in excess of 80 miles per hour, and reduced the running time approximately 2 hr. On January 2, the Chicago & North Western placed in operation between Chicago and St. Paul-Minneapolis its "400," a six-car steam-operated train which makes the 408 miles to St. Paul, Minn., in 420 min., as compared with a schedule of 10¼ hr. between these points heretofore.

On January 31, the Union Pacific placed its three-car streamlined train in semi-local service between

Salina, Kan., and Kansas City, Mo., where the 187 miles are traversed in 3½ hr., with six intermediate stops. The Pennsylvania is now operating its Congressional Limited and certain other trains with electric locomotives between New York and Washington, a distance of 225 miles, on schedules that will be reduced gradually until they reach 3½ hr., as compared with 4 hr. 15 min. now. During the year the New York Central has stream-lined one of its locomotives, which is now hauling the Twentieth Century Limited regularly between Chicago and Toledo, Ohio.

Other developments of like character are immediately before us. Already the Union Pacific has announced that it will place three Diesel-powered streamlined trains in service this spring between Chicago and Los Angeles, Cal., San Francisco and Portland, Ore., respectively, on schedules of less than 40 hr., as compared with minimum existing schedules of 53¾ to 59 hr. The Burlington has likewise announced that it will place two additional Zephyr trains in service between Chicago and St. Paul on schedules of 6½ hr., or 390 min., for the 431 miles.

The Milwaukee is also planning to meet these schedules with trains of light-weight construction, drawn by streamlined steam locomotives of new design, while the Illinois Central has under construction a five-car Diesel-powered streamlined train for use between Chicago and St. Louis, Mo., on a 5-hr. schedule, as compared with 6½ hr. now. In New England, the Boston & Maine will soon place in service its Flying Yankee between Boston, Mass., and Bangor, Me., reducing the overall time each way by 1 hr. 55 min. and calling for average speeds between Boston and Portland of more than 65 miles per hour.

Nor are these all of the high-speed trains now under construction, for the New Haven will receive its Zeppelin from the builders early in April; the Baltimore & Ohio is completing two trains, one with steam and the other Diesel power, shortly thereafter; the Santa Fe is building a 3,600-hp. Diesel locomotive to pull its Chief between Los Angeles and Chicago on a materially shortened schedule; and the Gulf, Mobile & Northern has two two-car trains under construction, while within the last few days the Burlington has announced that it will soon order still another Zephyr for semi-local service between St. Louis and Burlington, Iowa.

This development is not confined to any one area but is taking place throughout the country. Fostered by competition within as well as without the railway industry, it may be expected to spread like a prairie fire until its influence is felt throughout the entire field of railway transportation. It is not too much to expect that passenger service between major cities may be speeded up as much as 25 per cent within the next few years as the possibilities of the newer as well as the present types of equipment are more fully developed.

That the public has been quick to respond to this new service is shown by the volume of traffic carried by these new trains. The Burlington's Zephyr, for illustration, carried 193 per cent more passengers during December and January than were handled during the same two months of the preceding year by the steam trains which it replaced, while the increase on the system as a whole was 26 per cent. Likewise, the North Western's "400" train has been crowded to such an extent that an extra car has been required from the beginning, while the Union Pacific train has on several trips carried twice as many persons as there were seats available.

This business is coming in part from the trains replaced, it is coming in part from other trains, but it is also coming in part from competitive transportation agencies on the highways and in the air. On the Burlington's Zephyr, inquiry of passengers using the new train during the first two months showed that 16 per cent came from other agencies.

## Track Construction

In reviewing any development as fundamental and as far reaching in its importance as that of high-speed passenger transportation, it is essential that we consider its effect on existing railway practices and the extent to which it may be necessary to revise these practices. This leads at once to the track, since it is the foundation on which equipment of any type must operate, and no railway service can be better than its track.

Here we face first of all the fact that the burden placed on a track is measured in part by the weight of the equipment, but in part also by the speed at which it moves. Speed is, therefore, a very definite factor in track stresses. This brings us to the question of the adequacy of the present track structure. Is it strong enough? Or will some new and possibly stronger form of construction be necessary? There are some who contend that the present standards are inadequate for the high-speed trains. Are they correct?

In any analysis of track strength, it is well to review the developments of the last few years as they affect track maintenance. Prior to about 1918, the goal of track engineers was to keep their tracks abreast of the constantly increasing loads of cars and especially of locomotives. No sooner were bridges strengthened and heavier rail laid than mechanical and operating officers seized the opportunity to increase the size of their locomotives. This process was repeated time and again, with the result that the track was seldom far ahead of the demands being made upon it. Safety was a very constant concern of the track man.

About 1920, however, clearances and other conditions tended to retard the further enlargement of locomotives and axle loadings became relatively constant. In the meantime, the railways continued to improve their track structures—expenditures for heavier rail and fastenings, more ballast, improved drainage and other factors contributing to strong track exceeding all previous figures in the years 1923-29. As a result, the margin of strength was so greatly increased that safety ceased to be major consideration and the criterion for further expenditures came to be that of economic justification.

It soon developed that there is a broad zone between the lower limit at which expenditures for track maintenance must be made to provide adequate safety and that upper limit beyond which expenditures are economically unwarranted. As a result, the railways ploughed large sums of money into their tracks and roadway during the prosperous years prior to 1930 and thereby added greatly to their strength. These expenditures have stood the railways in good stead during the last five years of sub-normal maintenance. They are also a factor of importance in the operation of trains at higher speeds, for while it is self-evident that strength has been withdrawn from the tracks during the last five years of curtailed expenditures, it is equally true that the margin of safety is still materially greater than it was prior to 1923.

In the consideration of this subject, one must recognize also that while these high-speed trains, where operated, will fix the standards to which the tracks will be maintained, they will constitute a small proportion of the total traffic carried, and their effect on the wear and tear of track will be correspondingly limited. Further-

more, it is possible that the fast train of the future may be less severe on the track than its companion of today. Reduction in weight of standard equipment appears to be a companion of speed. Also, to the extent that Diesel power may prevail, it may be expected to be less destructive to the track by reason of its lower center of gravity and its absence of unbalanced parts.

### Maintenance Problems

So far as the maintenance of tracks is concerned, the first effect of high-speed train operation is to make necessary greater refinements in line and surface. It is common knowledge among track men that a track that will ride well at 40 miles per hour may ride very rough at 60 miles and be actually dangerous at 70 miles. In other words, the effect of small irregularities is magnified as the speed increases. It is essential, therefore, that track be brought to more accurate line and surface before high-speed operation is undertaken and equally important that this refinement be maintained from day to day. This will require reorientation of viewpoint of supervisory officers and track foremen alike.

Closely akin to accuracy of line and surface in the maintenance of tracks for high-speed operation is the proper elevation of the outer rail on curves. It is also essential that the amount of superelevation bear the proper relation to the character of the equipment operated and the speed at which it is operated. This requires a special study of the characteristics of the equipment to be operated at these high speeds (specifically, between steam and Diesel units, by reason of the lower center of gravity of the latter). Where curves cannot be elevated the full amount demanded by the speed, the speed must be reduced to that which may safely be operated at the elevation possible.

Of equal importance with the proper superelevation of curves is the maintenance of this elevation with accuracy, for even slight variations become of danger at high speeds. It is essential also that a train pass from tangent onto a curve without abrupt change. This calls for increased attention to easement curves or spirals, adding both to the necessity for their use and to an increase in their length. One road that has given this subject detailed consideration has extended its easement curves from 40 ft. per degree of curve to 100 ft.

Any marked increase in the speed at which trains are operated focuses attention on potential points of special hazard and accentuates the desirability of their correction. Especially is this true of turnouts on the outside of curves, where the practicability of removal to tangent track should be given careful consideration. Likewise, it may be desirable to revise the alinement at junction switches to favor the high-speed route. Again, every curve sufficiently sharp to require marked curtailment in speed introduces a degree of hazard which may possibly be modified or eliminated by the revision of line. The correction of conditions such as these, each minor in itself, will do much to insure the safety of operation of fast trains.

It is recognized, however, that even with all these precautions and with the most meticulous care in maintenance, the operation of trains at high speeds will increase the wear and tear on the track and will hasten the development of irregularities that will require still more maintenance. This will add to the cost and thereby increase the amount which a road is warranted in spending for stronger and more permanent track construction as a means of holding down current upkeep costs. The railways made large expenditures in the years prior to 1929 for the purpose of reducing maintenance costs. With the more exacting standards made necessary by the high speeds, this trend will be accentuated and the adoption of still stronger construction hastened—not primarily for reasons of safety but of economy.

# Signaling for Higher Train Speeds

By W. F. Zane

Signal Engineer, Chicago, Burlington & Quincy

During the past few years, there has been a gradual increase in the speeds of both passenger and freight trains, particularly the latter. The recent introduction, on certain railroads, of articulated streamline trains operating at high speeds, makes it important that the automatic block wayside signals be properly spaced to insure sufficient braking distance so that such trains may be brought to a stop before reaching a signal indicating danger. The Burlington's signal department has for some time been alert to these changing conditions, and the more recent installations of signals were made with these requirements in mind. In some cases, the older systems had also been brought up to date to meet this situation.

### Consideration From an Engineman's Standpoint

An automatic block signal system does not begin or end with the signal, the aspect of which is only an intelligent manifestation to the engineman of the condition of the track in advance. To insure safe train operation the signal must be a correct visual indication of the operation of a somewhat complicated combination of apparatus and circuits, which must be as nearly infallible as it is humanly possible to make them.

From the viewpoint of the engineman, the signal indication is influenced by two conditions: First, the necessity for proper braking distance at the maximum speed —in determining this distance it is necessary to consider track, grade, weight or tonnage of the train; second, the visibility of the signal, as seen by the engineman, which is also important, because the signal must be located where it may be observed far enough in advance to permit the engineman to apply the brakes and bring the train to a stop in ample time. The location of wayside signals on curves, at the leaving end of deep cuts or near the leaving end of bridges, where steel work obstructs the veiw, is not desirable.

### Consideration of Signaling System

Before the inception of the present popular articulated streamline trains, the operation of trains by signal indication had for years been studied by signal engineers. The Burlington is well equipped with automatic block signaling on all of its principal lines, and has also numerous interlocking plants of several types, sections of centralized traffic control, power-operated remotely-controlled switches and signals, as well as highway crossing signal protection at many locations. Therefore, the problem brought about by higher train speeds becomes primarily an analysis of the older signal systems which

were installed years ago when speeds of trains were much lower than at present. Portions of the lines are equipped with electric semaphore signals, but in the last few years color-light signals have been installed on other parts of the lines. Obviously, the signal department was vitally concerned in the braking ability of the new high-speed trains and also in the shunting of the existing track circuits by such trains. This latter is essential to the proper operation of any block signal system.

Information was obtained from the mechanical department regarding the braking distance required for such a train to stop, using the regular service application at different speeds and on different grades. Signal department representatives rode the high-speed trains during test runs, and used stop watches to check the time required to operate the different combinations of signal circuits and to determine whether sufficient time was available for each signal function to perform correctly.

### Changes Required

The increased speed of freight and passenger trains in recent years had previously required the moving of certain signals. The changes made recently to correct the signaling on the territory between Chicago and St. Paul, Minn., a distance of 431 miles, are as follows: Between Chicago and Aurora, Ill., 38 miles, the Burlington has a three and four-track system with short automatic blocks employing color-light signals. In this territory, it was not necessary to move any of the signals, the additional braking distances being obtained by repeating the caution indication on the two signal bridges approaching the bridge carrying the stop indication. Between Aurora, Ill., and Miner, Wis., a distance of 290 miles, the block signals are of the semaphore type, installed many years ago when trains operated at less speed than at present. These signals indicate "STOP" or "PROCEED," and have a separate caution signal for each "STOP" signal and, in some cases, the braking distance was between 2,500 and 3,000 ft. A thorough study by the signal department indicated that 153 caution signals should be moved to obtain greater distance between them and their governing home signal. The location of some of the home signals was such that the caution signal could be taken back to the next home signal and placed on the same mast, making a two-arm signal. In certain cases, it was necessary to move the signal in its entirety, including the concrete battery well and instrument cases, relays and other control equipment. Between Miner, Wis., and St. Paul, the automatic block signals are of the color-light type which are of comparatively recent development. Only four of these signals were moved because of insufficient braking distance.

Some of the signals which were respaced form an integral part of the automatic block system and others are part of the centralized traffic control system, interlockings, etc. All semaphore signals in this territory were approach-lighted. The introduction of high-speed trains in this territory required the extension of the control of the approach lighting to a full length of the block, approximately 2.5 miles. In the territory equipped with automatic color-light block signals, the continuous-lighting system is used, and no changes in circuits were made. All of this work was completed in 75 days, and the entire signal system is now operating satisfactorily.

When the new high-speed articulated streamline trains were first developed, the question arose as to whether the existing track circuit equipment would function properly owing to the lighter weight of such trains, as well as the greater speed and reduction in length of train. A study developed the fact that the existing track circuit equipment is highly efficient and reliable to meet all of these new operating problems.

### Controls for Crossing Protection Extended

The question of the operation of highway crossing signals arose at the same time. The Signal Section, A. A. R., requires that the crossing signals shall operate 20 sec. in advance of the fastest trains, a provision also required by various states. There would seem thus to be quite a spread between a train speed of between 80 and 100 m.p.h. for a passenger train and about 30 m.p.h. for a freight train, with the result that the highway crossing signal would be operated for too long a time for the freight train, as compared with the faster passenger train. However, it was found that the speed of freight trains has also been increased so that the spread between such trains and high speed passenger trains is now about the same as it was formerly between slower freight trains and 60 m.p.h. passenger trains. Consequently, it was necessary to lengthen the approach track circuits at highway crossings to provide 20 sec. advance warning for the fastest train.

Between Chicago and St. Paul, Minn., the Burlington has installed additional highway crossing signals and will shortly install reflectorized warning signs at certain highway crossings not equipped with crossing signals. These new installations result in greater protection for vehicles under high-speed train operation than was obtained with the slow-speed train operation previously in effect.

The line between Chicago and St. Paul has been divided into zones for the purpose of regulating the speed of streamline trains. The signal department designed reflex signs to be placed along the roadway 3,000 ft. in advance of each speed zone. A reflex sign with the letter "Z" indicates the beginning of a zone, and on the post below, figures indicate the maximum speed for an articulated train in that particular zone. If a curve is located within the speed zone, another reflex sign with the letter "C" is placed 3,000 ft. in advance of the curve, employing reflex buttons, and the speed limit is indicated immediately below. As soon as a train leaves the curved track, the zone speed is resumed until the train reaches the next zone or curve sign, when the engineman is governed accordingly. At present, these zone and curve speed reflex signs apply only to the Zephyr trains, other trains being governed by time tables and train rules in-so-far as speeds at different locations are concerned. Train rules have been prepared for the guidance of the motormen of the Zephyr trains through these speed zones.

### General Considerations

There is every indication that the art of signaling has advanced just as rapidly as the increase in the speed of trains. Earlier systems of signaling have been modified and improved from time to time to meet changes in the operation of trains, and the results have been highly pleasing. Train operation by signal indication entirely, which eliminates written train orders, is used extensively on the Burlington, with savings in time and with complete safety. This, in turn, created the development of remotely-controlled interlocking plants and centralized traffic control systems, employing power-operated switches, resulting in the elimination of unnecessary train stops. These new systems are inherently adapted to operate in conjunction with the higher train speeds now prevalent.

During the speed tests of the Zephyr train, signalmen were located at wayside signals to take electrical readings of track and signal equipment, to check the opera-

tion of control relays, signals, etc., with the result that we obtained valuable data which will be useful in the future. The introduction of the new Zephyr trains resulted in the respacing of the wayside signals as heretofore mentioned, but it is believed that these changes will be of as much benefit to the high-speed freight trains as to the Zephyr trains.

Recent experience has shown that the entire signal system is meeting the needs of high-speed train operation, and the results obtained between Chicago and St. Paul are gratifying. This is not only true of the signal system but also of the highway crossing signal protection, which is highly dependable and is of the type which holds the confidence and respect of the public.

# Zephyr High-Speed Brake Tests

**Fundamental data on brake action in super-speed zones are secured in important tests on the Burlington**

By Joseph C. McCune

Assistant Director of Engineering, Westinghouse Air Brake Company

The Zephyr, along with the Union Pacific, and other high-speed trains, has attracted much attention from the public. The public interest, very naturally, centers in the features which provide for reaching and maintaining high speed rather than in the facilities required for stopping the train. But, all railroad men understand thoroughly the essential necessity of the ability to stop these high-speed trains in reasonable distances.

It is doubted if all railroad men appreciate the complex and difficult problems encountered in producing stops with these trains in what might be considered reasonable distances. This lack of appreciation arises because the stop appears to be accomplished with so little effort. These new trains glide along the rails at high speeds with apparent ease and come smoothly to rest when the brakes are applied. The absence of any spectacular action suggests that the stop is made quite easily.

But substantial technical problems have to be surmounted to bring about this easy stop. The most basic of these problems arises from the tremendous energy contained in these high-speed trains. This energy may be expressed as so many foot-pounds, but a certain number of foot-pounds is a concept which cannot be visualized. Perhaps a better understanding can be obtained if a comparison is made with a freely falling body. A body falling freely for 333 ft. acquires a velocity of 100 m.p.h. Hence, when any train has a velocity of 100 m.p.h., it has the velocity and consequently the energy corresponding to a free fall of 333 ft. The results of dropping one of these new trains 333 ft. can be readily pictured. If the problem of the brake is conceived as stopping a train after a free fall of 333 ft., a better conception of the problems involved probably results.

To bring about a stop, all of the energy possessed initially by the train must be converted to energy in some other form, since energy cannot be destroyed. Consequently, large quantities of heat are generated during a stop. Some conception of the quantity of heat involved may be gained by considering what has happened prior to the initiation of the stop. To attain a speed of 100 m.p.h., the train has operated for perhaps 15 miles with wide-open throttle and under favorable grade conditions. During this 15 miles, the engine, say, of 600 hp., has been converting heat into mechanical energy. All of this heat, except as reduced by inescapable losses, is stored in a train as kinetic energy and, when motion of the train is arrested, it reappears as heat. Considered from this angle, it is apparent that the heat generated during a stop presents a problem which requires the application of high technical skill for an adequate and satisfactory solution.

In this connection, it should be noted that heat is generated whenever the speed of the train is reduced through brake action. Service or emergency brake applications, braking ratios, brake-shoe loads, modify the effects of heat, but heat, as such, is inevitably produced whenever the train is stopped. One advantage of light-weight trains not always considered lies in the reduction of heat generated during brake applications. Evidently, in stopping a train from a given speed, the lighter the train the lesser the problem of dissipating the heat produced during the stop. If trains are to be operated at ultra-high speeds, the weight of the train is of great moment from the braking viewpoint.

The foregoing has dealt with the energy contained in high-speed trains and its transference into heat. But in considering an actual stop from high speed, immediately one factor becomes of the greatest consequence; that is: "What adhesion is available throughout the stop?" Everyone understands that a train is actually stopped by the retarding force set up between wheel and rail by action of the brakes and that the magnitude of this force is dependent upon adhesion. Obviously, if the adhesion is low, the retarding forces must be low and consequently the stop long. Particularly, if the adhesion is low at very high speeds, long stops must be expected because the retardation is least when the speed is greatest. To make a short stop, the retardation should be high when the speed is high because then the greatest distance is being covered per unit of time. Evidently, adhesion at high speeds is of the greatest importance in obtaining reasonable stop distances from high speed.

Prior to the Zephyr tests, which were conducted on the Chicago, Burlington & Quincy near Earlville, Ill., in October, 1934, much controversy existed as to adhesion values at high speed. The situation was not unlike that prevailing in 1878, prior to the Galton tests, when uncertainty and controversy as to the friction of brake shoes hindered brake development. Correspondingly, doubt as to adhesion values in the recent past made uncertain whether the new high-speed trains could be stopped in reasonable distances. Probably the greatest value of the Zephyr tests, as affecting future brake development, lies in what was learned about adhesion at high speeds.

## Brake-Shoe Friction at High Speeds

Another kind of information, obtained during the tests, of far-reaching influence was that secured with respect to the behavior of brake shoes and wheels during emergency brake applications from high speeds. For the first time, the behavior of shoes and wheels was recorded in stops from initial speeds of 100 m.p.h.

In addition, information in respect to the action of the retardation controller was developed and as well, curves of stop distances for service and emergency brake ap-

plications. The knowledge gained will be discussed in greater detail in what is to follow.

Tests with the Zephyr established that although the brake-shoe friction varies with speed, it varies in a uniform manner from the lowest to the highest speed; that is, no evidence was found to support the view that the characteristics of brake-shoe friction alter markedly after some relatively high speed is attained. Tests from the 100 m.p.h. zone were entirely consistent with stops in the lower speed zones.

More explicitly, it has always heretofore been found that an increased braking ratio produced a shorter stop for any speed within the range encountered in the test. Prior to the test it was thought possible that a negligible gain might be experienced as a result of an increased braking ratio at very high speeds. Such results were not actually found. At a nominal speed of 100 m.p.h., a reduction in the braking ratio of the train from 175 per cent to 135 per cent lengthened the stop about 600 ft. A reduction to 123 per cent added some 300 ft. additional to the stop distance; a reduction to 97 per cent lengthened the stop again by some 800 ft.

In the 80-90 m.p.h. speed zone, wheel slippage did not result from application of braking ratios of 330, 305, 290, 275 and 265 per cent. It should be undersood that these braking ratios cannot be compared to the conventional braking ratios which are maintained throughout the stop. The test braking ratios were applied at a *constant high speed*. These tests indicate that very high braking ratios can be applied at high speeds, if protective apparatus is supplied to guard against wheel slippage at low speeds.

The evidence at hand indicates that no major reduction in adhesion occurs at high speeds. This conclusion is of the greatest practical consequence because it establishes that high retardation can be set up at high speed without wheel slippage. By means of special apparatus, which guards against slippage at lower speeds, it is possible to use higher braking ratios than formerly. These higher braking ratios will bring about greater retardation at the top speeds of retardation corresponding to that now obtained at the lower speeds. This procedure is permissible because, as stated above, the Zephyr tests have shown that the adhesion at high speeds is not radically different from that existing at the low speeds. Consequently, it appears physically possible, after further development and experience, to stop trains of the articulated type from speeds of 90-100 m.p.h. in about the same distance as conventional locomotive trains from speeds of 60-70 m.p.h.

## Performance of the Brake Shoes

The Zephyr tests supplied an opportunity, for the first time, to observe, in actual train tests, the performance of brake shoes (plain Diamond S, chilled) under the combined influence of heavy loads and very high speeds. The performance noted was quite satisfactory.

The brake shoe performance was normal under all conditions although exhibiting effects which would ordinarily be expected. That is, the degree to which the shoe was heated increased with the shoe load and the speed. The amount of metal removed increased with increase in these two factors but not to any disturbing extent. With high energy dissipation rates, the molten metal from the brake shoe would adhere to the wheel but much of it was of a flaky character and only temporarily attached to the wheel. That portion more permanently fastened to the wheel produced no discernible bad effects. The molten metal constituted a fire hazard to the right of way but this hazard appeared to be only slightly affected by the braking ratio. In nominal 100 m.p.h. stops, in one case with a train braking ratio of 175 per cent and in the other with a ratio of 97 per cent, it was found that brake shoe metal was deposited on the motor truck wheels in each case but in so far as visual inspection disclosed, to no great different degree. Metal was deposited upon the wheel only in cases of stops from high speeds. In such instances, a very thin coat of brake shoe metal appeared bonded to the wheel over irregular and variously spaced areas. The consensus of opinion among the observers present was that this condition was not a matter of concern.

The rate of wear of the brake shoes was not as rapid as had been anticipated. During the entire series of tests, only seven shoes were replaced and five of these were renewed prior to the tests proper because they previously had been worn to a degree which it was believed would not permit them to last throughout the contemplated test program. Two shoes were replaced on the No. 1 or motor truck before the tests were completed. One of these was renewed because it was feared that the shoe was too thin for stops from 100 m.p.h. although the tests later made showed this fear unjustified. One shoe on this truck was replaced because it had been worn too thin at one end during the testing. This shoe was 1½ in. thick when the test program started.

In considering brake-shoe wear, it must not be overlooked that great quantities of energy must be converted into heat when stopping the new trains from high speeds and that some kind of apparatus must take up this heat. It is doubtful if there is any cheaper or more satisfactory method of accomplishing this end than by heat absorption in the brake shoes. Furthermore, the most rapid wear of the brake shoes takes place during emergency applications from high speeds, which are of infrequent occurrence. It would appear that the advantage of securing relatively short stops is tremendously more important than reducing the rate of shoe wear.

## Wheel Performance Carefully Checked

Prior to the tests, there had been concern that the motor truck wheels would become overheated due to the heavy braking and the weight on the motor axles, which during the tests was approximately 50,000 lb. Consequently, the portable pyrometers were employed to read wheel-tread temperatures as soon as possible after the completion of the stops. In the four stops from a nominal 100 m.p.h. speed, the tread temperatures on the first wheel read were 480, 390, 350, 240 deg. F. In the other tests, a temperature as high as 300 deg. was seldom observed. These readings, as well as visual inspection, indicated no distress in the wheels from these extremely severe braking conditions.

As a matter of interest, the apparatus which recorded wheel revolutions permitted an investigation of the behavior of the wheel during a slide. Galton found during his tests that an appreciable time interval was required to arrest rotation of the wheels but modern data with respect to this subject has heretofore been completely lacking. The Zephyr tests supplied the first up-to-date information in this connection. It was found that, when at a speed of 25 m.p.m., sufficient pressure was manually admitted to the brake cylinder to cause sliding, the slide did not take place immediately but instead about one second was required before the revolution of the wheel ceased. Likewise, about the same time was required for the wheel to acquire car speed again. The interval between the dying down and the building up is determined by how quickly the cylinder pressure is released and, since this was done manually it is not known at precisely what instant the cylinder pressure was exhausted. Time

did not permit a complete investigation of this subject, but the information secured confirmed Galton to the effect that an appreciable time interval is required to arrest rotation of the car wheels.

### Equalization of Brake Work Between Trucks

The Zephyr is equipped with a retardation controller which responds to the retardation of the train. Whenever the retardation of the train itself attains a predetermined value, further admission of air to the brake cylinder is cut off. If the retardation thereafter increases to a predetermined higher value, cylinder pressure is released. By electrical means, one controller governs all cylinders in the train.

The retardation of the train is brought about by the combined action of the retarding forces set up between wheel and rail at each of the four trucks due to the brake application on these trucks. It is obvious that the retarding force between wheel and rail at one truck may not bear the same relation to the weight on the truck as exists at some other truck. But if this ratio becomes too high (that is, exceeds the coefficient of adhesion) sliding will occur. Stated differently, one truck may be so overbraked that wheel sliding is inevitable, while at the same time an adjacent truck may be so underbraked as to make wheel sliding a remote contingency. The retardation controller determines if the train as a unit is overbraked. Consequently, if one truck is overbraked and at the same time another truck underbraked, one condition may compensate for the other so that the train as a unit appears to be properly braked. If the retardation controller, which registers the retardation of the train, is to guard against overbraking on any one individual truck, and at the same time permit a high rate of retardation, obviously the degree of braking must be made the same on all trucks as nearly as practicable.

The degree of braking on the several trucks of the Zephyr did not correspond because, based on actual weights, the braking ratios were not the same. But even if the braking ratios had been identical, different degrees of braking would have been experienced because of the wide variance in brake shoe loading. It has previously been repeatedly mentioned that the coefficient of brake shoe friction decreases as the brake shoe load increases. Consequently, for trucks with the same percentage braking ratio, the degree of braking will be highest on the truck with the lowest shoe load. In other words, this truck will have the greatest tendency to slide. The braking ratios should not, therefore, in theory, be the same, but should be adjusted in accordance with the truck load, so as to make the degree of braking uniform on all trucks. Unfortunately, no reliable experimental data has heretofore existed to permit such an adjustment. On this account, tests of this kind were made with the Zephyr.

Among other things, these tests brought out what had been previously emphasized; namely, that the coefficient of friction increases as the shoe load decreases. For instance, with a shoe load of 4,730 lb., 127 per cent braking ratio will provide a brake equally as effective as 152 per cent when the shoe load is 18,850 lb. It is believed that the above tabulation represents the only information of this kind available based upon actual road tests.

### Retardation Controller—Stop-Distance Curves

The tests indicated that the type of retardation controller installed on the Zephyr should have a difference in its setting of about 1 m.p.h. per sec. to prevent "cycling" and that a release setting of 4.5 m.p.h. per sec. could be employed after the rear truck had been equalized with the other trucks, without intolerable wheel sliding resulting.

Stop tests were made which permitted plotting speed-stop-distance curves for both service and emergency applications. Since these curves apply only to the one train and are likely to be improved on all future trains, they are not included in this paper.

### Conclusions

Since the Zephyr tests, although of limited duration, were the first in which actual data was secured with respect to some of the more fundamental aspects of the brake problem in zones of very high speed, tentative conclusions may be drawn with reference to certain heretofore controverted phases of braking performance. Consequently, these tests, because of the influence they will probably exert upon the development of high speed, light weight trains, may, in time, rank with the memorable Galton tests of 1878 as a landmark in the art of braking.

The tentative conclusions are as follows:

(1) The friction of brake shoes in the 80-100 m.p.h. speed zone is determined by the same influences as in the 60-80 m.p.h. zone. That is, the brake-shoe friction at very high speed is entirely consistent with that heretofore experienced in the lower speed zone and does not, as thought possible prior to the tests, attain normally low values in the 100 m.p.h. zone.

(2) The adhesion between wheel and rail does not change markedly at the highest speed and may be entirely independent of speed, although the independence of speed and adhesion was not established beyond any question.

(3) Braking ratios of 300 per cent at speeds of 100 m.p.h. are possible.

(4) Modern brake shoes do not "break down" at the higher speeds as experienced in previous brake tests.

(5) The present 18,000-lb. limit for emergency brake-shoe load may be too low. A nominal shoe-load of 26,000 lbs. was used successfully in a stop from 103 m.p.h.

(6) The rate of wear of the brake shoes is not abnormally increased by stops from 100 m.p.h.

(7) The car wheel showed no distress in a stop from 103 m.p.h. with 26,000-lb. shoe load.

(8) The car wheel requires an appreciable interval to cease revolving during a slide.

(9) The coefficient of brake-shoe friction decreases as the shoe load increases. A braking ratio of 127 per cent with 4,730-lb. shoe pressure was as effective as 152 per cent with 18,850-lb. shoe pressure.

(10) An inertia device, the retardation controller, permitted high braking ratios at high speed because it limited the braking ratio at low speeds.

(11) The brake equipment installed on the Zephyr was effective and flexible, although handicapped by a low braking ratio.

(12) No fundamental physical limitations were found which would preclude, with further development in the brake art, stops of trains of the Zephyr type from 90-100 m.p.h. in the approximate distances required for every-day conventional locomotive trains from speeds of 60-70 m.p.h.

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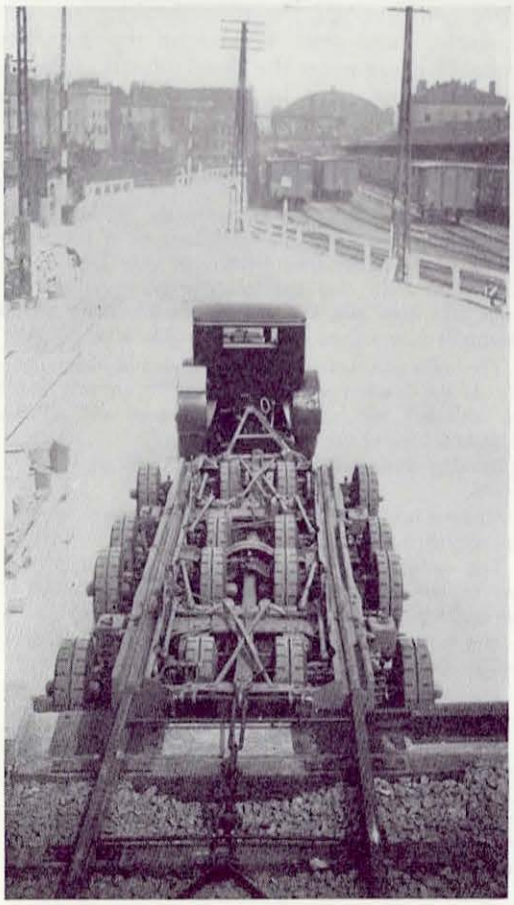
More Than a Million Passengers last year took advantage of the reduced party rates which were introduced by the railways of Great Britain. The plan under which "parties of eight can get a cheap rate" was particularly attractive to city dwellers desiring to spend a day or week-end at shore resorts. The arrangement is characterized in a recent press release of the Associated British Railways, Inc., New York, as "another indication of the effort shown by British Railways to develop passenger traffic now that they have succeeded in obtaining Parliamentary regulation of all forms of transportation, thus eliminating the unrestricted bus and truck competition."

# Motor Transport Section

# Freight Cars on the Highways

German railways evolve new plan for providing storedoor delivery of carload traffic



The Chassis in Position for Loading

FOR some years, European railways have been active in providing storedoor service of various sorts, including a widespread use of containers for merchandise traffic. In Germany, beginning in the autumn of 1933, the storedoor plan was extended to cover storedoor collection and delivery of carload shipments to shippers and receivers not having sidetrack facilities at their plants. This was accomplished by having railway cars leave the right-of-way for the first time in railway history, and transporting them by motor vehicle through the streets to their destination. Since the trial installation was made, a number of freight-car-carrying highway units have been placed in operation, with the result that, in a 14-month period, approximately 6,300 cars were handled in this manner.

### Cars Up to 60 Tons Capacity Handled

The European freight car is, of course, smaller than its American equivalent, but cars of 60 tons capacity have been handled on the paving. In addition, large passenger sleeping and dining cars have been handled on these truck units to avoid complicated and time-wasting switching and turning movements in such large centers as Berlin and Munich.

### Operating Methods

The operation has lent itself to a wide variety of uses, including that of street paving. Dump cars with heavy loads of gravel have been conveyed to streets under repair, and the gravel deposited direct from the railway cars onto the streets at the locations where it was needed.

In accomplishing the transfer of cars from railway to highway units, the truck bodies are backed against a stub-end track, which is at the same level as the rails on the truck body. At a point about six feet from the edge of the platform, the track rails are provided with a form of hinged joint, manually operated, that permits the ends of the rails from the joints to the edge of the platform to be swung laterally (without altering the gage) for the purpose of bringing these rails in alinement with the rails on the truck body. In this way, the rather complicated and time-wasting spotting and respotting of the truck body to obtain the exact alinement necessary is avoided.

### The Truck Bodies

The truck bodies consist of two units, each running on eight wheels carried on radial axles, so articulated as to provide for negotiating the sharp curves necessary in driving through city streets. The cushioning provided by the 16 wheels in the double unit is sufficient to prevent any damage to the streets or highways, even under the heavy loads normally carried.

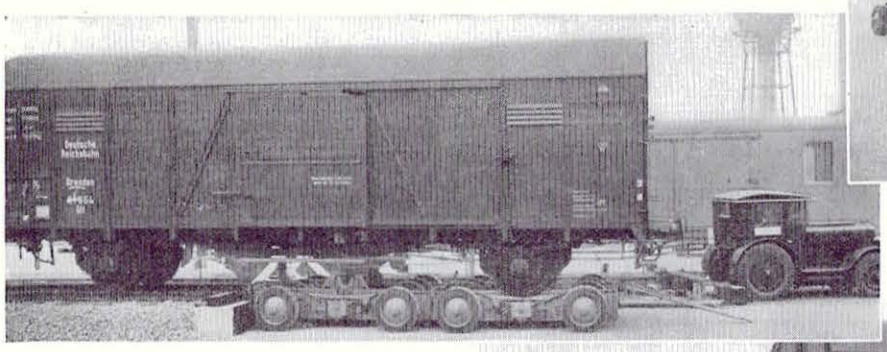
Each truck body is provided with auxiliary connecting and steering rods, which permit the two units to be widely separated for the handling of unusually long cars. The bodies are so constructed as to permit of the application of these rods quickly and without difficulty. The details of the construction of the carrying portion of the highway unit are shown in the drawings appearing on the opposite page.

While enroute, the cars are held in position by so-called 'forks,' which are attached to the chassis and lie

flat when not in use, but which provide such secure fastening that, in the entire experience with this operation, under all sorts of conditions, there has been no instance of the cars shifting while enroute.

At first, despite all the precautions taken, it was feared that the hauling of such heavy loads on city streets would destroy paving. Experience has shown, however, that this is not the case, the cushioning provided by the 16 double-tired wheels being ample to take care of all shocks. The speed limit is held strictly to 10 miles an hour and careful tests have shown that no damage results.

An Open-Top Car in Transit



Above: Loading Car on Chassis
Right: A Freight Car on the Movable Truck

The careful inspection given all the units at frequent intervals, together with the care taken by the railways to use only the most responsible men as drivers has rendered the operation free from accidents of any nature. At the same time, claims for damages to commodities handled in this manner have practically disappeared.

The success of the experiment is indicated by the constantly increasing number of these units that are being placed in service. Railway officers are finding the transfer of railway cars by highway to have many practical uses, other than that originally proposed for carload storedoor collection and delivery for companies not provided with sidetrack facilities.

Included in the constantly growing list of commodities being handled in this manner are coal, coke, foodstuffs such as chocolate, coffee, meal, etc., cotton, steel, iron, machinery, boilers, wood, sawdust, oil, gasoline and livestock.

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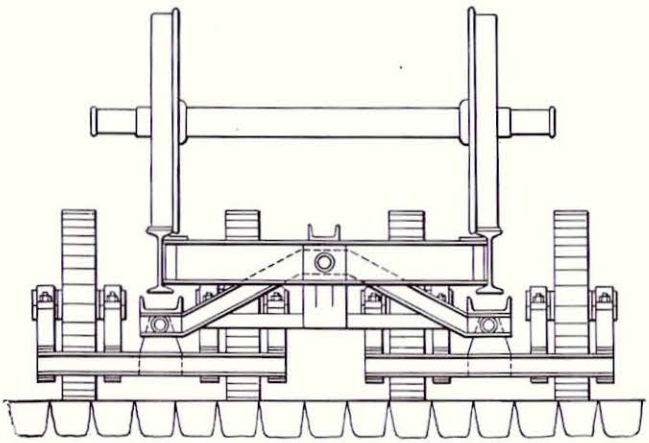
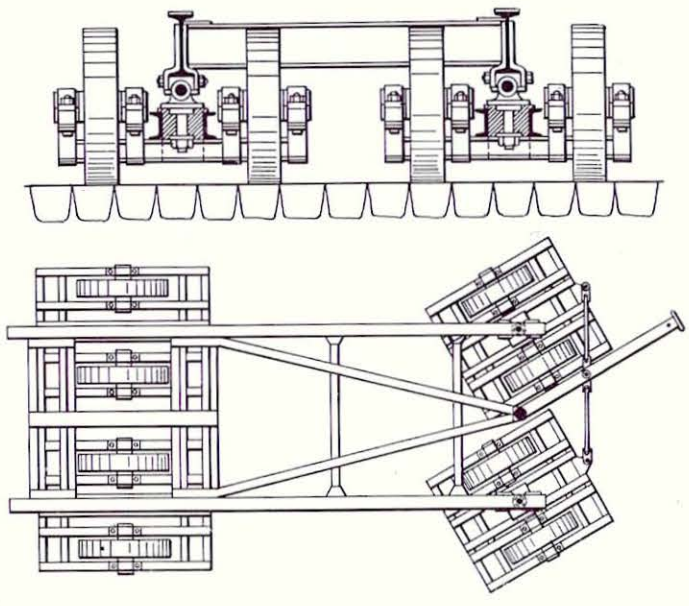
AN INCREASE OF 36 PER CENT in the amount of stock handled occurred during the first 60 days of the Illinois Central experiment in live stock pick-up and delivery service now in operation on its western lines. The results are further reflected in the fact that while there was a net loss of 5 per cent in the revenue on live stock moved on the entire railroad, the net revenue from live stock handled in pick-up and delivery service, after allowing for the cost of the service, increased 7 per cent.

Construction Details of the Car-Carrying Chassis





# Burlington Begins Daily Service to Pacific Coast

THE tri-weekly Pacific Coast Bus service of the Burlington Transportation Co., which started on December 31, as announced in the *Railway Age* of January 19, has now been expanded and placed on a daily basis, effective March 17. The new daily service provides for leaving Chicago in the morning, serving Davenport, Iowa, and Des Moines, Omaha, Neb., Cheyenne, Wyo., Salt Lake City, and arriving in Los Angeles early the third morning, which allowing for difference in time, represents a schedule just under 72 hours.

The service is being operated with eight new General Motor coaches, whose purchase was announced in the issue of the *Railway Age* referred to above.

New Equipment Is Being Used for the Transcontinental Service

# Semi-Trailer Enters New Field

THE Southern Pacific Motor Transport Service, a subsidiary of the Southern Pacific railroad, has placed in operation a new type of Trailmobile special trailer, known as model T-222, the novel feature of which is a hopper body which extends down through the center of the frame. This result can be accomplished only through the use of a semi-trailer designed for the purpose, as there would be interference with the drive shaft if the hopper body was mounted on a conventional motor truck. The interference which would normally occur through the impaired clearance of the prop mechanism has been overcome by an ingenious design whereby the prop screws are synchronized and mounted on the outside of the frame members. The Southern Pacific Motor Transport Service has ordered ten of these units from the Trailer Co. of America, following the installation of the first unit.

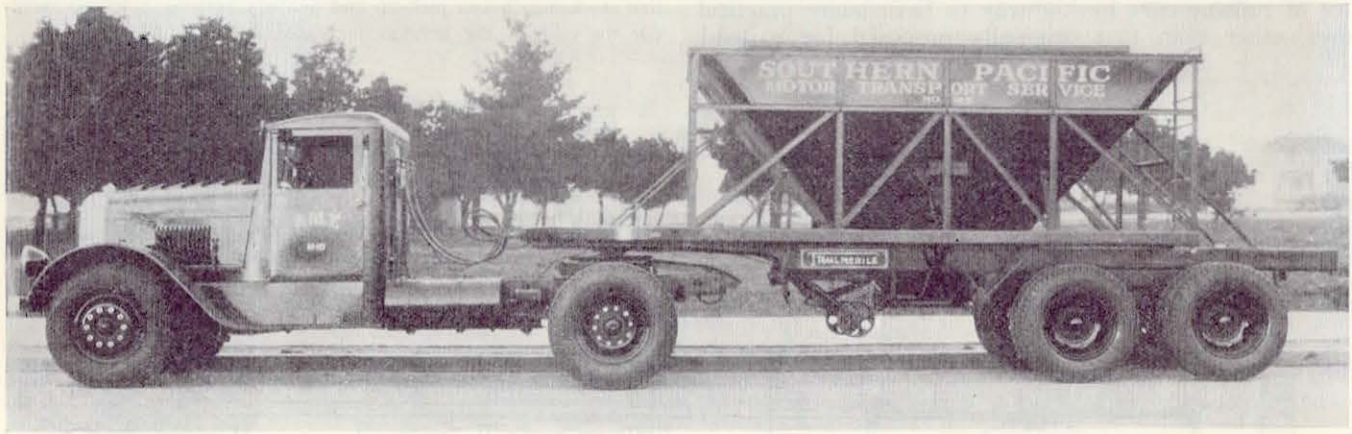
These hopper trucks will be used for handling bulk cement for the construction of the concrete pipe line connecting the Colorado river with the Los Angeles metropolitan water district. The unit is equally well adapted for handling other bulk materials, and similar units will be used for the transportation of bulk grain, lime and various aggregates to and from rail heads on the Pacific Coast.

### Unusually Light-Weight

Unusually light weight is achieved in this trailer and hopper type body, and the hazards of dumping, together with the costly dump mechanism, power take-offs and heavy hoists are eliminated. The hopper has a capacity of 11 cu. yd., and the chassis and body, completely equipped, weigh 8,300 lb., which permits a greater pay load than could ordinarily be obtained.

Two man-holes have been placed in the top or roof of the body into which the material is loaded. Eccentric latches seal the man-holes to prevent moisture from injuring the cargo. There is also a cat-walk on the top which can be used for loading out of box cars at railroad sidings where a depressed loading space may be provided.

A special vibrator has been developed to overcome the tendency of certain bulk materials to arch when being




New Trailmobile Unit Used by the S. P. Motor Transport Service in Cement Handling

unloaded. This vibrator sets up the movement necessary to break such arches. This does away with the practice of having workmen beat upon the side of the vehicle, as the vibrator accomplishes the same end and does not injure the body.

A shuttle system of truck operation is being employed to excellent advantage by the Southern Pacific Motor Transport Service in the handling of cement, as delays are frequently experienced in dumping into storage bins. Through the method of handling which is being adopted, the trailer may be set out and the tractor return with an empty hopper, in this manner increasing the flexibility of the operation and permitting the tractor to maintain a steady and adequate flow of the bulk material required.

The hopper is so designed that it may be removed from the semi-trailer when not required in bulk material service. Provision has also been made in the body construction for the conversion of the semi-trailer to a flat-rack type, if desired.

## World's Largest Milk Depot

THE Great Western of England has just completed transportation arrangements for serving the recently constructed milk depot of the United Dairies, London, which is the largest operation of its kind in the world.

The milk is brought to certain concentration points on the Great Western, either in highway tank trucks or in cans. Special cars for the conveyance of highway milk trucks by rail are used in this service, the trucks being driven on to the railway cars under their own power by means of ramps. Each of these cars is equipped with a set of channel irons to facilitate this operation and to hold the trucks in place during the rail movement. Each car is also equipped with specially arranged chains for anchoring the trucks enroute to avoid damage to either the trucks or the lading. In transporting the milk by cans they are loaded from the highway trucks into cars especially fitted for carrying milk containers. Especially fast schedules are in effect from all the concentration points to the new milk depot.

On arrival there, the cars are spotted at a receiving platform, and the milk is unloaded through a system of pipes, thus making it unnecessary to unload either the highway trucks or the containers from their respective cars.

After the tank trucks and the containers have been emptied, they are subjected to a process of cleaning and sterilization, and the cars carrying them are distributed to the various producing centers by special express train service, supplemented by regular passenger train service.

Unloading the Highway Trucks Without Removing Them from the Cars

## Pick-Up and Delivery for Off-Line Industries

WHAT promises to be the most extended application of pick up and delivery service to be initiated in this country will be started on April 1 if the plans of at least 10 major western roads to establish pick up and delivery service to off-line industries in more than 20 cities in seven mid-western states are consummated.

This action may be considered as a forerunner of a movement that may eventually result in a system-wide application of store-door pick up and delivery service on most, if not all, of the western lines. The proposal to extend pick up and delivery service has been under consideration for some time and has met with opposition on the part of several carriers. As a result a number of roads plan to go ahead, as of April 1, regardless of the opposition from others. Tariffs have been filed which specify that free service will be extended to any business shipping a minimum of 6,000 lb. daily. The number of shipments required to make up the minimum is not limited.

One line also proposes to establish rates equal to 60 per cent of the first-class rate to apply on all l.c.l. merchandise regardless of classification rating. From this

start it is almost certain that the services will gradually be extended to other cities and ultimately to a system-wide application.

Action was precipitated by the Chicago & North Western which announced that service will be made available on April 1, or as soon thereafter as necessary arrangements can be worked out, at 29 points on the North Western and the Chicago, St. Paul, Minneapolis & Omaha, including practically all major cities in northern Illinois, Wisconsin, upper Michigan, Minnesota, Iowa, Nebraska and Missouri. Chicago, Milwaukee, Minneapolis, St. Paul, Omaha and Kansas City are the principal large cities; but the list also includes such important mid-western trade centers as Cedar Rapids, Duluth, Des Moines, Sioux City, Lincoln, Madison, La-Crosse, Winona, South Omaha, Rockford, Freeport and numerous others.

The Chicago, Milwaukee, St. Paul & Pacific, on April 1, will inaugurate free pick-up and delivery service of l.c.l. freight when shipped in lots of 6,000 lb. or more. The service will be available to all shippers or receivers of freight in Chicago and in 25 other important traffic centers on the company's lines.

## Hearings on Water Carrier Bill

(*Continued from page 453*)

Chester Gray, representing the American Farm Bureau Federation, also opposed the bill. J. L. Coleman, representing the Terminal Grain Elevator Association, opposed provisions in the section relating to wharfingers which he said would cover all inland elevators in the United States.

J. O. McClintock, manager of the Chicago branch of the Farmers' National Grain Corporation, objected to extending regulatory authority over water transportation, declaring that "cheap" inland waterway transportation has been of benefit to the farmers without increasing the cost to the consumers, and he said that Mr. Eastman had said that regulation would raise water rates.

Senator Wheeler said he thought his fears were groundless, because if the commission regulated rates on the basis of cost it would be of benefit to the farmers and the general public. When he spoke of the commission as being "railroad-minded," Senator Wheeler said that was because it had been trying to administer a law telling it to allow the railroads a fair return. On the other hand, he said, if freed of regulation the railroads would put the water carriers out of business and Congress must face the practical proposition that there is a tremendous propaganda going on all over the country for the repeal of the fourth section. With separate regulating bodies, he said, there would be interminable confusion and no co-operation or co-ordination between them.

H. W. Warley, appearing for the Maritime Association of the State of New York and the Calmar Steamship Corporation, controlled by the Bethlehem Steel Company, opposed the proposal to place intercoastal transportation under the I. C. C., saying that the regulation of the Shipping Board Bureau is adequate. He also opposed regulation of foreign trade as entirely impracticable and particularly objected to the commodities clause in the bill, saying it was manifestly the purpose to compel industries to divest themselves of their private shipping and that the industrially owned tonnage is the backbone of the American merchant marine.

C. E. Childe, chairman of the traffic committee of the Mississippi Valley Association, opposed the bill on the ground of "the public value of existing low-cost water transportation" to the interior of the United States, which he said ought to be encouraged. He said that regulation as applied to railroads has worked badly but that it is needed and must be continued, although "the I. C. C. in 50 years has not succeeded in bringing rail charges into any reasonable relation with the cost of transportation" and the main kinds of discrimination which the act aimed to cure "are still in the rate structure."

Charles Haight, appearing for the American Association of Tramp Operators in the Canadian and West Indies Trades, asked the committee to eliminate from the bill everything relating to foreign commerce, saying that attempts to regulate operations in competition with foreign shipping would destroy our export trade. He made the point that the emergency act did not contemplate co-ordination of foreign commerce and said that while Mr. Eastman had studied all the problems of domestic commerce with great care and diligence he had made no study of foreign commerce.

Newton D. Baker, general counsel for the Lake Carriers' Association, asked that the bill be amended to exclude from regulation bulk carriers of ore, coal, grain and stone on the Great Lakes. He said he thought the commission would exclude them under the discretionary provision of the bill but he was asking Congress to do so to avoid the confusion that would be caused by the element of uncertainty.

## Investigation of Railroad Financing Proposed

(*Continued from page 454*)

competition of trucks, pipe lines, water carriers, and other means of transportation, must modernize the railroad plants in order to put themselves on their feet. This will require tens and hundreds of millions of dollars. Millions more are needed also to restore even the present properties to decent working condition. In the last few years, most of the roads, to keep their heads above water, have been slashing their expenses to the point where the properties have been allowed to run down. The restoration of the present physical plants of the railway companies, and remodeling of those plants to meet new conditions, mean that the American investing public will be called upon for hundreds of millions of dollars of additional investment in the railroads. This need for new capital comes at a time when, as has just been reported to Congress, "recent experiences have greatly impaired confidence in railroad investments."

If there is anything that the current depression has taught us about the restoration of confidence in the public mind, it has taught us that confidence cannot be restored by the magic of fine words or by the magic of suppression of the truth. The way to restore confidence is to get the facts, to secure redress for the investing public, and to make sure that the railroads and the twenty to twenty-five billion dollars of the people's investments will be placed in hands far more honorable and far more competent than in the past.

What is to be done? It may be said that there is no need for getting more facts, that we have a sufficient number of them. The truth, however, is that we have hardly begun to scratch the surface. A number of agencies in the past and more recently have been collecting facts relating to railroad finance. They have been doing good work, but their work is at most fragmentary, related to a particular railroad alone or to a particular situation alone. Nobody has yet undertaken the job that must be undertaken, and that is to give the American public, who constitute direct and indirect investors in railroad securities, a picture of railroad finance as a whole. The Interstate Commerce Commission has produced valuable facts. The Reconstruction Finance Corporation has produced valuable facts. The Securities and Exchange Commission, through its study of protective committees, is getting valuable facts. The Federal Coordinator is doing great service. But these agencies are limited in one way or another. Some lack the subpoena power

for a general investigation, some the authority and even the funds. All have necessarily been restricted and limited by the nature of their duties, and none of them has been able to undertake the work which must be undertaken if we are to get out of this depression on a sound basis, on a basis that will insure against our getting back into the depression almost as soon as we get out of it.

One requires no better proof of the need for a thorough inquiry than the proof that in spite of such facts as are already known, some of which I have mentioned to the committee today, the very men responsible for the evil practices of the recent past, as well as the distant past, are still in control of our railroads and still in control of pending railroad reorganizations.

One may cite another important fact. Congress has empowered the Interstate Commerce Commission to examine the books, records and files of the railroads. The commission can send its examiners in and they can find out what is recorded in those books and files. No similar authorization has been given to the commission to look at the books and records of a railway's bankers, insofar as those books and records relate to the affairs of the railroad for which they are bankers. In other words, an exception is made in the case of the books and records of the people who really control the railroads. The commission must stop short just when it is getting to the heart of a transaction, just when it is getting to the records of the men who know most about what had been done in the affairs of the railroad, and just when it is getting to the records of the men who determine in many cases exactly what the railroads shall or shall not do. Your committee, once the resolution now before you is passed by the Senate, would not be subject to any such barriers.

# Communications . . .

## Bring Back the Toll Gate!

West Haven, Conn.

To the Editor:

During the years 1914-1918, off and on, I was associated as expert on railway credit with Clifford Thorne, general counsel, for numerous western states and shippers' and farmers' organizations in the general rate cases before the Interstate Commerce Commission. In contact with the Public Railway Commissions and the general subject of rate regulation, I found that the prevailing note of criticism against the railways arose from the idea that the railways had a monopoly of transportation—or a quasi-monopoly, as Professor Hadley used to phrase it. Permit me to make a few suggestions in the light of the developments of 1919-1935.

1. Railway transportation has become competitive again. Bitter competition exists with airways, waterways and roadways. Yet, the railways are not permitted to hold their own in a fair competition through fixed rates on one side and federal subsidies in road building on the other side. In the meantime, the cost of building and upkeep of fancy and useful highways mounts, until the tax burden on real estate is staggering. The time has come to revert, in my opinion, to simple justice and Benjamin Franklin's theories of thrift and common sense—taxation less—direct charges for federal benefits to those benefited.

2. My theory of a just, competitive basis consists in setting up toll gates every five miles on all main highways and collecting one-half the Interstate Commerce Commission rate on all shipments by auto trucks. Use this money for road building and upkeep and relieve real estate, as well as automobile owners of license taxes, gasoline taxes and tire taxes. Transportation of passengers by buses would be handled in the same way. The railways would compete on an even basis. Before the airways become filled with freight and passengers, the same principle—charge one-half the I.C.C. rate on freight and passengers for the use of the air and the airports. What greater folly to permit one invention to destroy an earlier invention, when general good is not particularly served thereby. Now, go one step farther and collect from boats of all description, river and coastwise, one-half the freight and passenger rate for their use of the water courses, breakwaters, lighthouses, harbor improvements, costly docks and life saving service. Let the funds collected be used to pay for costs of the industry—the airports, the highways, the dredging of rivers, and the upkeep. This relieves real estate and individuals from income taxes, etc., and puts the cost on the traffic, as is just.

3. This is politically reasonable and finds a vast number of interests ready to co-operate; auto owners to escape gas tax and license taxes, real estate owners to escape levies to help build harbor improvements, gasoline companies now singled out and punished, railway investors, who will gain again the value lost in their securities, employment for many in minor positions at the toll gates, small towns escaping expense for bridges. The list is legion. All it needs is organization.

4. An inventory should be made of the fair value of all highways, bridges, harbor improvements, breakwaters, etc., and on this, the government should earn 5 per cent for maintenance and three per cent for interest, and establishing fair rates should depend on making all forms of transportation profitable on the same rate basis. It is hard to realize how many problems would be solved by this simple rearrangement. Relieving the taxpayers on real estate would stimulate traffic in itself. With increased volume, lower rates become possible. Everywhere, through rates become possible by truck, air, water and railway by universal bills of lading.

John P. Norton.

## Is a Box Car a Box Car?

Warren, Ohio.

I have been following the pro and con discussions of the proposed box car pool in the *Railway Age* with interest and find a divergence of opinion that prompts me to raise the above question.

To the mind of the economist, a Class I box car seems to be a Class I box car, regardless. The customer's mind disagrees with this classification. He wants a small part of the Class I box cars and wants nothing to do with the remainder, just as he differentiates between the same class of steel made by different producers, or as his wife chooses between two sellers' apples when she goes to market.

Commissioner Eastman's department seems to have taken the economists' view of the matter and the railroad men who have written have championed the customers' view.

In New England, I am told, the older plants have loading bays predicated on spacing 36 foot cars and they do not want 40 foot cars. In the far west, where freight rates dictate heavy loadings, the demand is for high and wide 40 foot and 50 foot cars. In the tin plate district the demand is for a certain type of car and in the grain producing districts a car with some other feature is wanted. Thus a New England maker of hardware does not want an empty 40 foot car from the west, the shipper on the west coast will not accept a 36 foot car from New England, and the Pittsburgh tin maker or the sugar importer does not want a Class I car unless it is dust-tight.

This divergence in customer demand accounts for the lack of standardization in box car equipment in the past and indicates that future cars must be designed with the customers demands in mind. It further precludes any ideal arrangement of car usage as visioned by the pros in the pooling controversy.

The railroads have long learned that the "Public be damned" policy does not bring either good will or business. Other forms of transportation are always on the alert to cater to a customer's shipping requirements and the present time would be a particularly inopportune one to change the shippers' mind as regards the kind of car in which to ship his goods. To the customer, a box car is only a box car when it is of a size and of a construction dictated by his ideas of his requirements.

Observer.

# Odds and Ends . . .

### Profitable Record

Phonograph records of the famous old railroad song: "The Wreck of Old 97" have sold at the rate of over $50,000 a year for the past 10 years.

### Railway Pay Checks

I. G. Hull, agent for the Atchison, Topeka & Santa Fe at Hulah, Okla., settles all claims as to the smallest railway pay check. He owns Santa Fe pay check No. 54151 R. R., dated July 1, 1934, in the amount of one cent. They don't come any smaller than that.

### New Ruling

Sooner or later—and usually sooner—railways are involved in every new development. The training of dogs to aid the blind has made remarkable progress in the past few years. Now the Illinois Central comes forth with a special ruling permitting such dogs to ride with their masters on its through and suburban coaches.

### Fare Enough

Rulers are now part of the equipment of Chinese railway conductors. A new order provides that children shall be paid for by the foot. Those under 2 ft. 6 in. ride free, those between that height and 4 ft. 4 in. pay half fare, and taller ones are classed as adults. On this basis, a considerable saving in railway fares could be effected by a troupe of midgets.

### Abolishing Tips

There is no country where the practice of "cumshaw" or tipping is so prevalent and time-honored as in China. Yet the Chinese railways are the first to abolish tipping in dining cars. An edict recently issued provides for instant dismissal of any dining-car attendant accepting any form of gratuity. The tipping evil is one that might well be studied in the revival of passenger traffic in this country. In the United States, however, the practice has never reached the high nuisance value that it has on the European railways, where the engine crew are the only ones who don't expect tips; or in fact, demand them. The nuisance has reached such proportions that a notice is printed on sleeping-car tickets to the effect that the attendant is entitled to demand ten per cent of the value of the ticket from the passenger as a tip. Since first class sleeping car accommodations on such trains as the Orient Express cost from $15 to $50, it can readily be seen that the attendant does an excellent business if travel is heavy.

### Cashing In

Need for cash evidently is compelling persons to part with souvenirs which long have been cherished for their sentimental value. In the last week, E. J. Johnson, auditor of passenger receipts of the Northern Pacific, St. Paul, Minn., received from widely separated cities, old-time transportation which had not been fully used and upon which the cash value was sought. One was a ticket which came from a resident at Hallock, Minn. This ticket was purchased in Minneapolis 44 years ago—on March 19, 1890. The ticket was for transportation from St. Paul to Stillwater, Minn., on the St. Paul & Duluth, which long since has been taken over by the Northern Pacific. The redemption value of the ticket was about 45 cents. Although it is a railroad rule that the issuing railroad should refund on its unused tickets, under the law claims must be made within six years from date of sale. Redemption on this ticket had been outlawed by the statute of limitations. From New York came a mileage book, purchased in Duluth on July 11, 1885, in which still remained unused coupons. The refund value was requested. This ticket showed that its first use was for a trip on July 11, 1885, between Duluth and Wadena, Minn., and the last trip on August 2, 1889, from Wadena to Duluth. The obligation on the part of the railroad for refund on this 50-year-old mileage book also had been removed by the statute of limitations, Mr. Johnson explained to the applicant in his reply.

### Mobile Fashion Show

Eager passengers enroute to Florida no longer have to wait until their arrival there to see the latest modes in bathing suits. On the Orange Blossom Special of the Seaboard Air Line, a mid-winter fashion show is given enroute, with five delectable damsels serving as models.

The Models Display the Latest in Beach Wear While Enroute

# NEWS

## A.A.R. Takes Over Study of Co-ordinator's Reports

### Plan announced following March 15 conference between Pelley and Eastman

Following a conference between J. J. Pelley, president of the Association of American Railroads, and Joseph B. Eastman, federal co-ordinator of transportation, on March 15, it was stated that an arrangement had been made by which the railroad association had taken over various reports on which recommendations of the co-ordinator's organization had been made to the three regional co-ordinating committees, for study and comments, which are to be transmitted to the co-ordinating committees for submission to Mr. Eastman. This course, adopted in the interest of saving time and circumlocution, by which the association will act in a sense for the committees, applies to the reports on merchandise traffic, terminal unification, and passenger traffic and presumably also to the report on the handling of carload freight traffic which is expected shortly from the co-ordinator's organization. The railroad association had previously taken over the study of the car pooling report and a definite announcement of its position on the matter is expected soon.

The emergency transportation act, under which the co-ordinator was appointed, provided specifically for the transmission of his recommendations to the three regional committees and it is understood that this has resulted in a rather roundabout procedure.

The check of all empty freight-car mileage on the railroads of the United States for a two-week period in December, undertaken by the association in connection with a study of the car pooling plan, has been completed and is under review by officers of the association. It indicates a very much smaller possible saving through elimination of "excess" empty mileage than that estimated in the report of the Car Pooling Section. It is understood also that the report on the proposed "frozen per diem" plan, which had been approved in principle by the American Railway Association, is awaiting final decision as to whether and when it shall be made effective.

### Southern Pacific Tours to Mexico

Effective January 7, the Southern Pacific began the operation of a unique Mexico tour which has attracted a capacity passenger list practically every week since. A specially equipped, air-conditioned Pullman car leaves El Paso, Texas, weekly, proceeding to Nogales, Ariz., over the Southern Pacific. From there, with numerous stop-overs at points of interest, the car is run over the S. P. of Mexico down the West Coast to Mexico City. The passengers may stay in Mexico City for a week or longer if they desire. The tour then proceeds northward over the S. P. and the National Railways of Mexico to El Paso, taking a week for the journey, with numerous stop-overs. At all points except Mexico City, the car serves as a hotel, the passengers sleeping and eating on the car. This land cruise is also included on round trips from the East to the Pacific Coast at inclusive rates.

### Southern of Great Britain Elects New Chairman

Robert M. Holland-Martin was recently elected chairman of the Southern of Great Britain to succeed Lord Wakehurst. Mr. Holland-Martin, who is well known in British banking circles, joined the board of the former London & South Western in 1910 and became deputy chairman of the Southern in May, 1932.

### Virginia Approves Flashing-Light Signals

The State Corporation Commission of Virginia has approved the installation of flashing-light electric signals at grade crossings of the Virginia State highway, over the Atlantic Coast Line tracks at Drivers and at Nansemond; and has authorized the discontinuance of the service of watchmen.

### North Western Radio Advertising

The Chicago & North Western, on March 19, began a series of radio broadcasts over station WENR, Chicago, to advertise its services and vacation territories, with a view to increasing vacation travel. Half hour broadcasts will be made between 8.30 p.m. and 9 p.m. on every Tuesday for 13 weeks. The major part of the program will be musical, including orchestral music and singing.

### R. & L. Historical Bulletin

The Railway and Locomotive Historical Society (Boston), has issued its bulletin No. 36. This is a pamphlet of 47 pages, devoted wholly to one subject, a history of the Colorado Midland Railroad. This road, chartered in 1883, to run from Colorado Springs westward, with a half-dozen objective points in the Rocky Mountains, passed through a checkered existence and its career was ended in 1924, with most of its roadbed abandoned and some of it devoted to State highways.

## Problems of All Industry Now Like Railway Problem

### Addition of New Deal in business to Old Deal in transport has made it so, says Dunn

"The problems of the railroads and of other kinds of business have been made very similar by the addition of the New Deal in business to the Old Deal in transportation," said Samuel O. Dunn, chairman of the Simmons-Boardman Publishing Corporation and editor of *Railway Age*, in an address on March 19 at the dinner of the Committee of One Hundred of Miami Beach, Fla. "Business men can not make their influence effective in behalf of a solution of our great economic problems in general if they lay themselves wide open to the criticism that, with selfish and callous inconsistency, they favor the continued application to transportation of government policies the application of which to their own industries they oppose.

"Whatever may have been true in the past, transportation is now highly competitive, and there is no good reason for government treating it differently in future from other competitive industries unless for the purpose of establishing order and stability where it has now created something approaching chaos. Many business men say that they favor a reduction of regulation of the railways rather than an increase in the regulation of their competitors. All carriers are parts of the same industry and should be treated alike, just as all parts of any other industry should be. If other carriers should be subsidized, then the railways should be.

"Obviously, to withdraw subsidies from other carriers by requiring them to pay adequately for their use of all public property would be preferable to subsidizing the railways. Complete abolition of regulation of railways would be politically impossible to secure. Furthermore, some regulation of all transportation is economically necessary to prevent unfair discriminations demoralizing to commerce, to co-ordinate the different classes of carriers so that each will be speedily restricted to the kinds of service for which it is best fitted, and to remedy the present dilution of the earning power of all carriers which deprives the capital goods industries of one of their largest markets. The solution is a reasonable reduction of railway regulation and a reasonable increase in regulation of other carriers.

"For some thirty years our public policy in this country made a distinction that amounted to a wide difference between the

railroads and business, and in carrying out this public policy our politicians were ably aided and abetted by most of our business men. The railroads were guinea pigs that were being vivisected to determine what was the matter with business in general, and what treatment of it was needed to cure it of its constant unhealthy tendency to earn profits and increase the national wealth and income. We have long had the Old Deal in transportation.

"But now two important unforeseen developments have occurred. The Old Deal in transportation has almost killed the railroads, and many public men believe something must be done to restore them to health. But the experiments upon them have not yet yielded enough information regarding the problems of political economy, and so it has been decided to practice vivisection upon other kinds of business to get the fuller and more exact knowledge required to keep business from earning profits and thereby repeatedly ruining its health and spreading a contagion causing employment, and increased wealth and income, throughout the entire population.

"With a not surprising inconsistency, other kinds of business are protesting against being cast in the role of guinea pigs. They say it will impair their initiative and enterprise and hinder them in increasing their production and employment. The experience of the railroads indicates that they may be right. The Old Deal in transportation and the New Deal in business are so similar in many important respects, however, that it is difficult to understand how men of intelligence and fairness can believe that the New Deal in business can do any harm without also believing that the Old Deal in transportation should be soon and radically changed.

"It is complained that the New Deal contemplates government regulation and restriction of profits. There is nothing new about that. Congress in 1913 passed the La Follette act for a valuation to provide a 'yardstick' with which to measure the reasonableness of railway profits. Government regulation of prices and profits, and even government provision of a 'yardstick' to measure them, have long been highly approved by business for the railroads. Even within recent weeks, shippers representing many industries have been appearing before the commission in opposition to a small advance in freight rates. They have demanded that the commission shall exercise in their favor its power of railway price-fixing. If government price-fixing and regulation of profits in some industries are of public benefit, why should they not be in all industries?

"Strong opposition is expressed by business organizations to government policies of investing the tax payers' money in enterprises to compete with public utilities, manufacturers and coal mine operators. When the government, as owner, developer and maintainer provides a waterway without charging for its use it becomes a partner in the business of furnishing water transportation in competition with the railways, and usually with the tax payers' money pays at least one-half, and often much more than one-half, of the cost of the service rendered. And what is the difference between using the tax payers' money to provide competition for power companies, manufacturers, and coal mine operators, and using it to provide highways for motor carriers that pay rentals for their use that are less than the taxes it costs the public to provide them? Why should business, including big business, use its political influence to racket the railways and panhandle the tax payers, and then protest against the farmers, unemployed and war veterans following its example?

"Is it worthwhile to make a real effort to solve the problem of the railways under private ownership, or should they be allowed to drift into government ownership? First, government ownership would enormously increase the present enormous national debt. Second, it would add more than one million men to the present unprecedented army of government employees. Third, it would make it necessary for the tax payers to shoulder a huge railroad deficit. Fourth, it would inevitably be followed by extension of government ownership to other industries. The government would soon convince itself that it could make locomotives, cars, materials and supplies for its railways cheaper than private manufacturers. It would soon convince itself that it could mine coal cheaper than it could buy it from private operators. In the years immediately before the depression the railways paid $3,000,000,000 annually in wages and spent more than $2,250,000,000 in annual purchases from other industries. In view of these facts and figures, how long do you think, after the government acquired the railroads, that complete state socialism could be postponed in this country?

"The only policies that need to be adopted to prevent government ownership and solve the railroad problem under private ownership are the same policies that need to be adopted to enable any other industry to live under private ownership.

"We can not terminate the depression by merely improving this or that kind of business, because its improvement may be gained at the cost of some other kind of business a revival of which is equally or more necessary to the restoration of prosperity. We can not fully restore prosperity as long as traffic is so divided among a multiplicity of carriers, owing to artificial and unfair government policies, because the railroads and other carriers are the largest potential customers of the capital goods industries, and they can not buy adequately from the capital goods industries as long as the earning power of all of them, and especially of the railways, is so diluted as it is now and as it will continue to be as long as the entire transportation industry is artificially over-expanded by unfairly discriminatory government policies."

## Choose Safe Places to Play

This admonition to boys and girls is the feature of poster No. 142, which has been issued by the Safety section, A. A. R., for the guidance of safety committees in the month of April. The circular is addressed, not to railroad officers or employees, but to "young people, their parents and friends." The circular has the familiar picture, long used in this field, of the boy on crutches, who has had one leg cut off at the knee in a railroad accident; and in this case the picture is repeated to show for each year of the last 11 the size of the casualty record, as affecting boys and girls and young people (presumably to the age of 21) since the beginning of 1923. The lowest record is that for 1929, when 993 individuals in this class were killed or injured on the railroads of the United States; for 1933, the total is 1,610, the largest in the 11 years. The reader is reminded that danger lurks on railroad tracks and trains which are either moving or standing still. The poster repeats the gruesome lecture in another form; in a picture depicting a wounded boy being carried off railroad premises on a stretcher.

## Col. Anderson Addresses New York Traffic Club

Col. Henry W. Anderson, co-receiver for the Seaboard Air Line, addressed the noon-day luncheon meeting of the Traffic Club of New York on March 20, on the subject of "Common Sense in Transportation."

## Changes in Co-ordinator's Organization

H. H. Temple, eastern regional director for the federal co-ordinator of transportation, has resigned to accept a position as chief engineer, Department of Highways, for the state of Pennsylvania. W. F. Kirk, formerly assistant to the director, Section of Regional Co-ordination, has been appointed eastern regional director with headquarters at New York City.

## Norfolk & Western Better Service Meeting

As a part of its program to familiarize employees with the company's activities and thus improve its service, the Norfolk & Western will hold 204 local better service club meetings at 21 places on the railroad during the next 10 months. The manufacture of steel and other products, the preservation of health, personal service, responsibility and courtesy and coal selling are some of the topics that will be given consideration at these meetings.

## R. V. Fletcher Addresses Traffic Club of Wilmington, Del.

R. V. Fletcher, vice-president and general counsel of the Association of American Railroads, was the principal speaker at the annual dinner of the Traffic Club of Wilmington, Del., which was held at the Hotel du Pont in that city on March 5. Judge Fletcher, taking as his subject "The Transportation Problem in the Light of the Co-ordinator's Recommendations," explained the various transport bills now before Congress and also outlined briefly the work which Co-ordinator Eastman has been doing. With reference to the permanence of the co-ordinator's office, the speaker said that while the railroads have the highest regard for Mr. Eastman, and if there is to be a federal co-ordinator they would prefer his continuance in office, they nevertheless see no necessity for subjecting them to a form of governmental control which invades the field of managerial discretion and goes beyond the pow-

ers of the Interstate Commerce Commission.

Speaking generally of the legislative outlook, Judge Fletcher expressed confidence in the enactment by the present Congress of sound legislation which would enable all carriers fairly to compete along lines which would be in the public interest.

## Railway Club of Pittsburgh

The Railway Club of Pittsburgh (Pa.) will hold its next meeting at the Fort Pitt Hotel, Pittsburgh, on Thursday evening, March 28. J. M. Fitzgerald, vice-chairman of the Committee on Public Relations of the Eastern railroads, will speak on railroads and the national welfare. There will be a musical program by the Orpheus choir of 40 voices.

## Railway Labor Act Found Applicable to Three Electric Railways

The Interstate Commerce Commission has announced the results of investigations instituted at the request of the National Mediation Board, finding that the Texas Electric Railway, the Sacramento Northern Railway, and the Waterloo, Cedar Falls & Northern Railway are not street, interurban, or suburban electric railways within the exemption proviso of section 1 of the railway labor act as amended June 21, 1934.

## Great Lakes Regional Board

The Great Lakes Regional Advisory Board will have its next meeting at the Carter hotel, Cleveland, Ohio, on March 27. The principal discussion will be on matters proposed by the Federal Co-ordinator. R. V. Fletcher, vice-president and general counsel of the Association of American Railroads, will address the meeting; and at the noonday luncheon, L. C. Probert, vice-president of the Chesapeake & Ohio, will speak on government ownership.

## Twin Zephyrs Ready for Service in April

The Twin Zephyrs being built for the Chicago, Burlington & Quincy will be placed in service between Chicago and the Twin Cities in April on a schedule of 390 min. for the 431 miles. A cruising speed at times approaching 100 miles an hour will be necessary to make up for station stops and slow orders for these trains, which will depart from the respective cities shortly after noon. The route will be west from Chicago via Aurora, to Savanna, Ill., and then along the Mississippi river for 300 miles.

## Freight Claims Received Show Increase

A total of 1,703,893 freight claims were filed with Class I railroads in the United States during 1934, as compared with 1,514,986 in 1933, 1,594,309 in 1932 and 1,979,290 in 1931. During the year, 72,494 claims were reopened and 165,185 were carried over from the previous year, making a total of 1,941,572 claims considered during 1934. Of these, 1,587,471 were paid and 194,741 were declined or withdrawn, leaving 159,360 claims unsettled at the close of the year. Of the claims disposed of, 75.6 per cent were paid, declined or withdrawn within 30 days, 15.7 per cent within 30 and 90 days and 8.7 per cent after 90 days.

## Extension of Term of Co-ordinator Proposed

Representative Crosser, of Ohio, has introduced in the House a resolution to extend for another year the effective period of the emergency transportation act of 1933, under which Commissioner Eastman was appointed federal co-ordinator of transportation. The emergency part of the act expires on June 16. The resolution also provides for a further extension beyond June 17, 1936, by proclamation of the President for an additional year or part thereof. Passage of such a resolution would extend the restrictions contained in the law against reductions in railroad employment.

## San Diego Exposition to Create Travel

Another world's fair, which is expected to attract seven to ten million visitors, will be held in San Diego, Cal., this summer, beginning on May 29. This fair, the hundred-million-dollar California Pacific International Exposition, will contain many exhibits of industry and government, including American rail transportation, which will be displayed in the transportation palace. In an effort to secure rail travel to the exposition, the Southern Pacific has launched an advertising campaign in national magazines and newspapers, full pages being published in the Saturday Evening Post of February 23 and Collier's of March 2.

## Crossing Accidents Analyzed

The Erie Railroad during 1934 recorded 213 grade crossing accidents, presumably all of them involving automobiles; and this total is 18 per cent greater than the total for 1933. Cases of drivers on the highway crashing into the side of a railroad train continue numerous, and in this last year's record, they constitute 26 per cent of the total; and another 24 per cent (which, being added, makes half of the total) is recorded as cases of cars being stalled on the railroad track before the arrival of any train. A further classification reveals that about two-thirds of these 213 mishaps occurred at crossings where red lights or bells or gates or watchmen furnished special warning to drivers. And there were 66 cases where the evidence tended to show that drivers disregarded the signals of watchmen.

## Appropriation for Grade Crossing Elimination Proposed

The House committee on roads on March 14 favorably reported to the House a bill, H. R. 4301, introduced by Representative Secrest, of Ohio, proposing appropriations of $400,000,000 for state highways, $300,000,000 for rural roads, and $300,000,000 for railroad grade crossing elimination, to be apportioned by the Secretary of Agriculture to the states. The proposed appropriation for grade crossings is to be apportioned to the states 50 per cent on the basis of population, 25 per cent on the basis of federal-aid road mileage, and 25 per cent on the basis of railroad mileage.

Representative Cartwright and a subcommittee of the committee on roads called on the President to urge his support for the bill on March 20 and stated afterward that he was giving it serious consideration.

## Record Freight Movement at Ford Plant

All existing records for the movement of railroad freight through the Rouge plant of the Ford Motor Company at Detroit, Mich., were broken in February when shipments in and out of the plant exceeded 30,000 cars. This total is greater than the previous record movement in April, 1930, and exceeds the January total, which was 27,000 cars. A new record for a single day was set on February 20, when 3,029 cars were in the Rouge plant yard at 8 a.m., with 500 additional cars waiting at Flat Rock, Mich. This unusual volume of freight in and out of the Rouge plant is due to the February production schedule together with preparations for a still larger production in March. In order to handle this unusual volume of traffic, it was necessary to rent 10 locomotives to supplement the Ford fleet of 12 which are in service in the plant yard.

## Representative Huddleston Proposes New Rate-Making Rule

Representative Huddleston, of Alabama, has introduced in the House a bill, H. R. 6799, to amend section 1 of the interstate commerce act to make it unlawful for railroads to make rates "from one point to another point over a route which passes through two or more rate zones or territories, in any one of which zones or territories a rate level different than that in any of the others is recognized to exist," which exceed the rates which would result from applying an aggregate of charges ascertained by applying the same rate per mile, for the transportation in each zone or territory traversed, as if the transportation services were performed wholly within that zone or territory. It is provided that this shall apply only to commodities as to which rates are generally made on distance scales approved by the commission and that the commission may authorize reasonable groupings.

## Defective Grab-Iron Used as Foot Brace; Lower Court Reversed

The Supreme Court of the United States has reversed the lower court in the case of Swinson versus C. St. P. M. & O., which was reported in the *Railway Age* of December 15, 1934, page 811, and holds that a brakeman who fell from a moving freight car because of a defective grab-iron which he was using as a foot brace in releasing a hand brake may recover, under the Federal Employers' Liability Act, for violation of the Safety Appliance Law by the maintenance of a defective grab-iron.

The Supreme Court says that as the failure of the grab-iron was the proximate cause of the injury, it was error to direct a verdict for the defendant railroad. "There was evidence on which the jury might have found that the grab-iron was not secure, for use strictly as a hand-

hold, and that if it had been, it would not have failed, since the use made of it by Swinson did not subject it to appreciably greater strain. There was evidence, also, that use as a foot brace was a natural and not unusual one. For such a use of the grab-iron, Swinson was entitled to assume that it was secure." Swinson v. Chicago, St. Paul, Minneapolis & Omaha.—Decided March 11, 1935. Opinion by Mr. Justice Brandeis.

## Capital Expenditures in 1934

Gross capital expenditures made by the Class I railroads in 1934 were greater than in any year since 1931, the Association of American Railroads has announced. Complete reports for the year, which have just been tabulated, show that gross capital expenditures for railway equipment and roadway and structures totaled $212,712,000. In 1933 such expenditures totaled $103,947,000 while in 1932 they were $167,194,000. In 1931, however, they amounted to $361,912,000.

Gross capital expenditures for locomotives, freight and passenger train cars and other equipment were greater in 1934 than for any corresponding period since 1930. Such expenditures for equipment in 1934 totaled $92,005,000, compared with $15,454,000 in 1933; $36,371,000 in 1932; $73,105,000 in 1931 and $328,269,000 in 1930.

For roadway and structures in 1934, gross capital expenditures totaled $120,707,000, compared with $88,493,000 in 1933 and $130,823,000 in 1932.

## Average Fare on American Air Lines Is 5.9 Cents Per Mile

Passengers on the scheduled domestic air lines in the United States were paying an average fare of 5.9 cents per mile at the beginning of this year, according to a statement by the Bureau of Air Commerce, Department of Commerce. This is the lowest average fare rate ever in effect on the air lines. As late as 1929 the average rate was 12 cents per mile. For about four years it has been in the neighborhood of 6 cents per mile.

The Bureau has found that the average length of an air passenger's trip is increasing. In 1934 the average was 407 miles, as compared with 367 in 1933. Percentage of available space occupied on the airplanes in 1934 was 51.82. Taking into consideration the miles flown and capacity of airplanes, the bureau found that the air lines flew 362,546,746 seat miles in 1934, and that the passenger-mile flown totaled 187,858,629. The air lines started 70,930 flights in 1934 and completed 66,591 or a percentage of 93.88.

## I. C. C. Prescribes Air Mail Rates

The Interstate Commerce Commission on March 14, released its decision of March 11, under the provision of Section 6(a) of the air mail act of June 12, 1934, fixing fair and reasonable rates for the transportation of air mail by airplane over each air-mail route in the United States, except Route No. 31 between St. Petersburg and Jacksonville, Fla. Operations on the latter route were commenced only shortly prior to the hearings in the investigation. The commission decided that fair and reasonable rates should be ascertained upon the weight of the mail and, according to the act, that the rates fixed for each route should apply to mail loads of 300 pounds or less, subject to the increases provided by the act for greater loads. The rates are designed for application to each airplane-mile actually flown with mail, and are made flexible to meet changes occurring in the mileages from time to time.

The present act directs the commission to enter an order publishing the rates which it fixes as fair and reasonable, but does not require that those rates shall be substituted for the present contract rates. Legislation to make the commission's rates effective is now pending, intended to result in increased compensation on most of the routes on basis of the service now being rendered. The report of the commission states that in fixing fair and reasonable rates consideration was given to the necessity for adequate, modern equipment and for full compliance with N. L. R. B. standards of wages.

## Automobile Casualties, 1934

The Travelers Insurance Company, Hartford, Conn., reporting its estimate of killed and injured on the streets and highways of the United States in 1934, gives a total of 36,000 persons killed and nearly a million injured. Of the killed, about 16,000, or 44 per cent, are classed as pedestrians.

The statistician finds that the increase over former records is not due solely to an increase in the use of motor vehicles; for deaths gained over the preceding year 16 per cent, while the consumption of gasoline increased only 6 per cent and the increase in registrations was less than 6 per cent. Excessive speed is the main cause of the serious automobile accidents.

Other items show: Drivers under the influence of intoxicants, 3.16 per cent (last year 2.43 per cent); pedestrians under the influence of intoxicants, 4.47 per cent (the year previous, 2.99 per cent).

Of the cars involved in accidents 9 out of 10 were in apparently good condition, though it remains true that a general inspection of cars usually shows 3 out of 4 in bad condition. Counting accidents (not per capita injured) it is found that 38 per cent of those causing personal injury occurred at street intersections; but of fatal accidents by far the largest number occurred on highways.

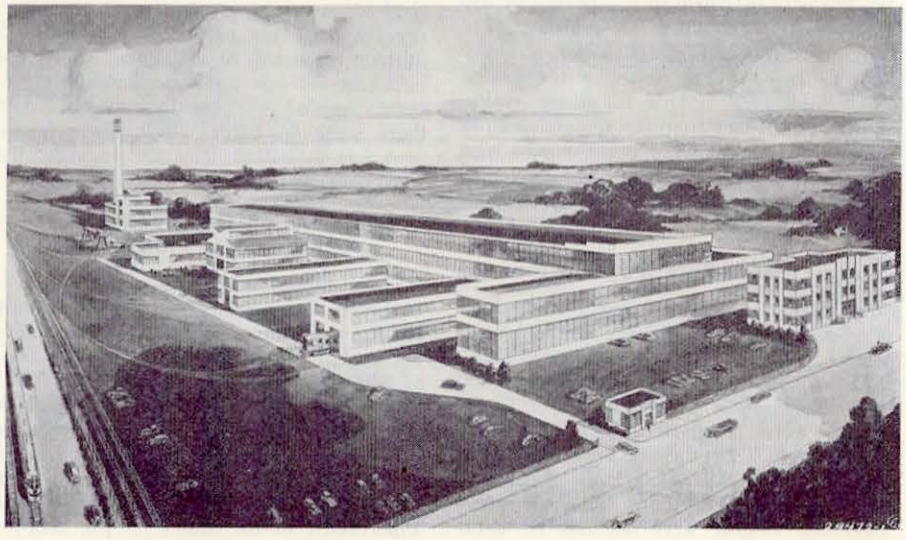
## General Motors Diesel Plant to Be Located at McCook, Ill.

The Electro-Motive Corporation, subsidiary of General Motors Corporation, is concluding negotiations for the purchase of a 70-acre tract of land in the village of McCook, Ill. (a suburb of Chicago), where it will build and have in operation by next fall a new Diesel electric locomotive plant. The Indiana Harbor Belt Railroad, from which the land is being purchased, was granted permission on March 15 by the Illinois Commerce Commission to sell the property, and the purchase will be completed within a few days.

This will be the first complete plant for the exclusive manufacture of Diesel electric locomotives in the country. It will consist of nine buildings, the largest of which will be 550 ft. long by 170 ft. wide. The contract for erection has been let to the Austin Company, Cleveland, Ohio. The various portions of the project include a three-story main office building 40 ft. by 140 ft., an employment office 15 ft. by 30 ft., an erecting and machine shop 170 ft. by 550 ft., a blacksmith shop 70 ft. by 75 ft., annealing ovens 22 ft. by 200 ft., a sand blast building 30 ft. by 150 ft., a paint shop 50 ft. by 140 ft., a warehouse 48 ft. by 140 ft., a power house 40 ft. by 60 ft., and railroad trackage, track scales and roads.

The buildings will be of steel, concrete, brick and glass. All of the 2,000 tons of structural steel framework will be welded in the shop and field, an unusual application of welding to heavy structural work. The main erecting aisle of the erecting and machine shop building will have a 104-ft. clear span 49 ft. high. It will be served by one 200-ton and two 30-ton electric traveling cranes. Two 20-ton cranes will be provided in the machine shop.

The office building will be of modern



The Plant Will Be Constructed on a 70-Acre Tract of Land

design throughout and will include a complete Frigidaire air-conditioning system to cool the air in summer and circulate and humidify warm air in the winter. There will be a cafeteria in the office building. Yard facilities will include a 15-ton gantry crane.

## U. P. Streamliner Filled to Capacity During First Month

During the first month of operation, the three-car, articulated stream-lined train of the Union Pacific was filled to capacity on practically every run, while at times it carried twice as many people as there were seats. During February, 6,505 persons rode the train, 3,062 being carried eastbound and 3,443 westbound. On one trip, a total of 254 persons patronized the train, while on February 24, the train entered Kansas City with 233 persons on board. On the eastbound trips during February, an average of 109 persons rode the train, while westbound the average was 123.

Because of the popularity of the streamliner, an additional run from Kansas City to Topeka, Kan., was added on February 23. The train leaves Salina, Kan., at 7 a. m., arrives in Kansas City at 10:30 a. m. and at 11 a. m. starts on its new run to Topeka, where it arrives at 12:08 p. m. It leaves Topeka at 12:30 p. m., arrives in Kansas City at 1:38 p. m. and leaves that city at 4 p. m. for Salina, where it arrives at 7:30 p. m.

## The "400" to Run on 6½-Hr. Schedule

The Chicago & North Western will reduce the running time of its "400" express train between Chicago and the Twin Cities from 7 hr. to 6½ hr. on April 28. Under the new schedule, 5 min. of the cut will be absorbed in the run from Chicago to Milwaukee, where the 85 miles will be covered in 75 min., or at the rate of 68 miles an hour, compared with the present average of 63.8 miles. The remaining 25 min. will be absorbed in the schedule between Milwaukee and St. Paul, where the new schedule will call for an average speed of 63 m.p.h., as compared with the present 57. The trains will continue to leave at 3:30 p.m. but will arrive at 10 instead of 10:30 p.m. This decision to reduce running time is based upon the success of the train in meeting its schedule since its inauguration on January 2. On numerous occasions, the train has had no difficulty in making up delays. An outstanding example occurred during the first part of March when the southbound train covered the 8 miles between Highland Park, Ill., and Indian Hill in 5 min., or at an average of 96 miles an hour.

## Pacific Limited Time Cut 8 Hr. 50 Min.

A reduction of 8 hr. 50 min. in the running time of the Pacific Limited, eastbound over the Southern Pacific, the Union Pacific and the Chicago & North Western, between San Francisco, Cal., and Chicago, and 7 hr. 20 min. in the running time of the same train between Los Angeles, Cal., and Chicago, will be made on April 1. This train, operating on a schedule of 59 hr. 25 min., will leave Los Angeles and San Francisco at 8 a. m. instead of 11 p. m. and 9 p. m., respectively, and will arrive in Chicago at 9:25 p. m. the third day instead of 7:45 p. m. on the fourth. A connection from Portland, Oregon, will be added to the train at Green River, Wyo., the Portland-Chicago running time being 59 hr. 10 min.

Westbound, 40 min. will be cut from the running time of the Pacific Limited to San Francisco, making it a 61-hr. 42-min. train. It will continue to leave Chicago at 10:30 a. m., arriving in San Francisco at 10:12 p. m. instead of 10:52 p. m. the third day. No change will be made in the running time to Los Angeles and Portland, the time now being faster than the new schedule to San Francisco.

## Proportional Charges on Air Express Traffic Carried in Rail Service

Charges for air express shipments are now being assessed in exact accordance with the type of transportation employed, according to a plan adopted by the Railway Express Agency last month. The new set-up contemplates, for example, that when a shipment is placed into rail express in order to speed its delivery when weather conditions or other circumstances cause plane failure, the charges collected are the sum of the air express charge between the points actually traversed by air and the rail express charge thence to destination or to such point as the shipment may be returned to air service.

These proportioned charges are made only if the total charge would be less than the all-air express charge and the reduced charge or refund is offered even though the total time in transit is less than would have been required by the fastest available rail express service. Previous arrangements by the express agency continue to provide for the refund of charges to the extent of the difference between rail and air service should the shipment require as much or more time than it would have by the fastest rail service.

## Katy Performance

The Missouri-Kansas-Texas mechanical department in 1934 established several records in efficiency. Only one boiler failure was recorded during the entire year, as compared with four the year before and 168 in 1923, the first year in which these records were kept. The average number of miles between boiler failures in freight and passenger service in 1934 was 10,145,656, a 99 per cent improvement over the performance in 1923, when only 89,863 miles were made between failures.

Locomotives traveled an average of 676,377 miles between failures in 1934, as compared with 526,602 in 1933 and 167,361 in 1927. Freight cars made an average of 389,138 miles between hot boxes in 1934, an increase of 52,223 miles as compared with 1933 and of 302,743 miles as compared with 1927. A total of 3,572,327 miles were made by passenger cars between hot boxes last year, compared with 862,233 in 1927.

Improved maintenance of car and locomotive air brake appliances was reflected in the fact that only 33 pairs of slid-flat freight car wheels were changed last year, as against 64 in 1933, and 1,244 pairs in 1925. The average mileage between such failures was 5,637,834, compared with 2,711,313 miles in 1933 and 222,923 miles in 1925.

## Modernized Cars on North Coast Limited

Modern air-conditioned coaches will be added to the North Coast Limited of the Northern Pacific for the coming tourist season. Not only will the coaches be air-conditioned and roller-bearing equipped, but the interior arrangement and appearance of the cars will suggest luxury and refinement. The main room will be entirely enclosed with bulk heads. A lounging and dressing room for men, with a seating capacity for 10 in arm-type chairs, upholstered in leather, will be at one end of the car, while at the other end will be a ladies' lounge and separate dressing room with a seating capacity for 8, provided with a davenport for 4, individual chairs and double seats. The floor will be carpeted and the ladies' dressing room will have several mirrors, including one full-length mirror at the door.

The main room in the new cars will seat 36 to 40 persons. Some of the coaches will be decorated in brown, others in blue and in gray, adding a variety in color scheme. The lighting will be of the overhead type and, in addition, individual lights will be above each double seat, in direct control of the pas enger. The seats are of entirely new design, 44½ in. wide with the back and seat cushions divided in the center.

## "Full Crew" and Train Limit Bills in Pennsylvania and New York

"Full crew" and train limit bills have been passed by the Pennsylvania House of Representatives with overwhelming votes, while a full crew bill has been reported out of committee in the New York State Senate and another similar measure has been introduced in that state's Assembly. Railroads serving these two large eastern states are, however, continuing their efforts to convince the legislators and the public of the economic unsoundness of such "make-work" measures and of the lack of necessity for them from a safety standpoint.

The Pennsylvania train limit bill would restrict the length of freight trains to 70 cars or one-half mile, while the effect of the pending "full crew" bills would be to require the employment of an extra man on virtually all trains. The Pennsylvania bills are now before the judiciary special committee of the state senate. This committee on March 19 held a hearing at Harrisburg, where the railroad presentations, from the operating and safety points of view, were made by M. W. Clement, vice-president of the Pennsylvania; C. W. Galloway, vice-president of the Baltimore & Ohio; and E. W. Sheer, vice-president of the Reading. F. J. Fell, vice-president and comptroller of the Pennsylvania, testified as to the additional costs with which the proposed bills would burden railway operations.

Mr. Fell estimated that the total annual cost of the two proposed bills to the railroads in Pennsylvania (using an average year and including operating wastage and

carrying charges on excess investment) would be $71,505,000. He also estimated that if the train limit bill becomes effective, it will result in a waste of present investment in facilities which have been provided to handle longer trains of in excess of $100,000,000, and wasted cost of operating locomotives of a greater capacity than required to handle shorter trains, plus carrying charges for interest and depreciation on facilities which would be rendered valueless by the proposed train limit law, would amount to over $20,000,000 annually.

The proposed New York full crew bill, it has been estimated, would add about $13,000,000 to the annual operating expenses of railways in that state.

## State Governors Try to Influence I.C.C. in Rate Advance Case

The Interstate Commerce Commission has found it necessary to advise the governors of several states, that have filed with it recently protests against increases in rates on coal proposed by the railroads in the general rate advance case, Ex Parte No. 115, that the commission reaches its decisions on the basis of the record made at open hearings and not upon communications received after the record is closed. Although the record has been closed and an early decision is expected, letters and telegrams protesting against the petition of the railroads in so far as it related to increases in coal rates have been sent to the commission recently, some of them in rather similar language, by the governors of Illinois, New Hampshire, Missouri, Massachusetts, Kansas, Nebraska and Rhode Island. Commissioner Aitchison, who was in charge of the hearings, has replied pointing out that the case was submitted upon a comprehensive record after six days of argument and was taken under advisement by the commission on January 15. The commission will endeaver to reach a proper conclusion, he said, "upon the basis of the record as made," including the question as to whether any increase should be made in the rates on coal.

Secretary Wallace, of the Department of Agriculture, has also, the commission's files show, sent to the commission additional material since the hearings were closed.

## "Engaged in Interstate Commerce"

The assistant foreman of a work train crew which was engaged in leveling a space alongside an interstate track, in order to prepare the foundation for a rail rest, was not engaged in interstate transportation within the Federal Employers' Liability Act so as to be entitled to compensation for injuries sustained by being struck on the head by the bucket of a steam shovel which was being lowered without adequate warning while he was standing beside the train giving orders for the work, the Second Circuit Court of Appeals holds —De Santis v. New York, N. H. & H., 74 F. (2d.) 261.

An employee injured by the derailment of a hand car which he was removing from a track to be cleared for the loading of cars with freight for another state, under a foreman's directions, was engaged in interstate commerce within the Federal Employers' Liability Act, the Second Circuit Court of Appeals holds, in Hoffman v. New York, N. H. & H., 74 F. (2d.) 227. The hand car was coupled to a gasoline locomotive used for switching. The court held that the gasoline engine was a locomotive within the Boiler Inspection Act and within the provisions of the Safety Appliance Act, which require a power driving-wheel brake on locomotives "and similar vehicles" (Sec. 8) and that a hand car operated by such a locomotive requires an automatic coupler under the act.

Although a locomotive fireman might have been employed in interstate commerce when riding free on a train to the place where he lived after his day's work was done, he was not so employed when he then boarded a light locomotive to go to a place where he had left his street clothes. —Second Circuit Court of Appeals; Young v. New York, N. H. & H., 74 F. (2d.) 251.

## "Mark Twain" Picked for Name of Latest Zephyr

One of the most famous pen-names in literature, Mark Twain, will be given Zephyr train No. 4, ordered by the Chicago, Burlington & Quincy to operate between St. Louis, Mo., and Burlington, Iowa, through Hannibal, Mo., the childhood home of Samuel Langhorne Clemens, novelist and humorist. The fictional characters, Tom Sawyer and Huckleberry Finn, likewise will be honored, the name of each to be inscribed on an individual car of this four-car, stainless, Diesel-powered train. The route throughout the intervening 221 miles will be beside the Mississippi river, the background for many of Mark Twain's stories.

In view of Hannibal's location midway between St. Louis and Burlington, and the further fact that most of the run is in Missouri, it was decided to name the fourth Zephyr train after that state's illustrious son. It is hoped that this new member of the Burlington's fleet of stainless steel, streamlined, Diesel-powered trains will be completed in time to participate in the Mark Twain Centennial now in progress at Hannibal.

The Mark Twain will provide an early morning departure from St. Louis, arriving at Burlington shortly after noon and returning in mid-evening to St. Louis. This Zephyr will replace present steam trains No. 43 northbound and No. 44 southbound. Buffet service and parlor car accommodations will be provided, an innovation for this run.

The twin Zephyrs now being constructed for use between Chicago and the Twin Cities will make their first run on April 15, when the trains will carry 150 Chicago business and industrial leaders on a round trip to the Twin Cities as part of plans to make the first run a historic event. Both trains will be run on a schedule of 6 hr., leaving Chicago at 7:30 a. m. and arriving in St. Paul at 1:30 p. m. Following the celebration on April 15, when the trains will be christened by twin sisters, the Zephyrs will be exhibited in Chicago on April 16; will make runs between that city and Aurora, Ill., carrying passengers the next day; and will be exhibited in Minneapolis, on April 18 and in St. Paul on April 19. While the date for the inauguration of regular passenger service has not been definitely decided, the trains may be placed in regular service on April 21. Under tentative schedules, the southbound train will leave Minneapolis at 12 noon and St. Paul at 12:30 p. m. and will arrive in Chicago at 7 p. m. The northbound will leave Chicago at 2 p. m.; will arrive in St. Paul at 8:30 p. m. and Minneapolis at 9 p .m.

## National Rivers and Harbors Congress

The thirtieth annual convention of the National Rivers and Harbors Congress will be held in Washington, D. C., on May 2 and 3.

The projects committee, headed by Senator Bennett Champ Clark of Missouri as chairman and composed of waterway leaders from each of the ten engineering divisions of the United States, will meet in advance of the convention on April 30 and May 1. This committee was created under procedure adopted at the last convention for the consideration and endorsement by the Congress of waterway projects which are "meritorious, engineeringly feasible and economically sound." The projects recommended by the committee and endorsed by the Congress will be urged for inclusion in the government's public works program.

Indications at the offices of the Congress are that this will be perhaps the largest convention in the organization's history in view of the widespread interest in the plans of President Roosevelt and his Administration for the development of the Nation's water resources, the proposed public works-relief program, and the important and far-reaching measures relating to waterways, their control and use, now pending in Congress. Interest in the allocation of public works funds for water projects, it was pointed out, has been intensified by the earmarking in the Senate of $350,000,000 of the Administration's $4,880,000,000 public works-relief appropriation for rivers and harbors, flood control, reforestation, soil erosion prevention, etc., and $500,000,000 for irrigation reclamation, water conservation, etc., which under the terms of the bill, may be increased by the President by $800,000,000 for each class of projects.

## Shipper Cannot Complain of Division of Rates Reasonable as a Whole

A wholesale dealer bought carloads of lignite at mines on the Canadian Pacific in Alberta, and sold them to retail dealers and others in North Dakota at Great Northern stations in competition with other fuel. The shipments moved on combination rates, being the sum of proportionals made respectively by the Canadian Pacific and the Great Northern, applicable from mines to destinations, and on through bills of lading issued by the C. P. routing over its railroad to junctions with the G. N., at the international boundary and thence over the Great Northern to places of delivery.

There was no applicable joint rate. The Great Northern collected the charges and paid the Canadian Pacific amounts equal to the proportionals established by the latter. The dealer complained to the Inter-

*Continued on next left-hand page*

# ONLY SUPER-POWER STEAM LOCOMOTIVES

## *Can Furnish This Service*

The comforts and conveniences of de-luxe appointments that long distance travelers have come to expect can only be had in steam drawn trains.

The higher speeds now demanded of these de-luxe trains require Super-Power Steam locomotives.

Lima is prepared to supply them.

LIMA LOCOMOTIVE WORKS INCORPORATED

LIMA OHIO

state Commerce Commission, alleging the proportionals filed by the Great Northern and other American carriers to be unjust and unreasonable. The Commission awarded the dealer $3,990 as reparation. 142 I.C.C. 543. The District Court for Minnesota gave him judgment therefor, which the Eighth Circuit Court of Appeals affirmed 72 F. (2d.) 587. This judgment the Supreme Court of the United States has reversed.

The Supreme Court holds that as the Commission made no specific finding as to the reasonableness of the combination through rate, the charges collected therefore must be deemed to have been just and reasonable. The court said in part that "the commission may not order or permit payment of damages by way of reparation without finding that the amount of the charge was unjust and unreasonable * * * The proportionals here involved are but parts of a through rate and cannot be distinguished from divisions of a joint rate. The shipper's only interest is that the charge shall be reasonable as a whole. It follows that retention by the defendant of an undue proportion of just and reasonable charges did not damage plaintiff."

The Great Northern under the Interstate Commerce Act was required to file tariffs establishing reasonable proportionals to constitute and to be kept in force as factors in the combination through rates applicable to plaintiff's shipments. Its failure to specify just and reasonable charges was a violation of the Act. And, if injured thereby, plaintiff would have been entitled to recover the damages sustained in consequence of such failure.—Great Northern v. Sullivan. Decided March 4, 1935. Opinion by W. Justice Butler.

## Too Long at the Wheel

"Too long at the wheel" is the title of a pamphlet of about 50 pages, just issued by the National Safety Council (Chicago) containing a study of exhaustion and drowsiness as they affect traffic accidents.

The review is made from a report by J. S. Baker and O. M. Gunderson, covering investigations made in 19 states and the province of Ontario, which investigations have involved 9,834 miles of travel by automobile, and much other travel; and extensive inquiries among state health, police and highway departments, insurance companies and others. The summary of conclusions says that drivers of trucks fall into this kind of carelessness more than other drivers, and that sleepiness is due not only to long hours of work but to much habitual wasting of energy in waiting times. There are regulatory laws in 42 states, but in very few places are such laws enforced. Proprietors of large fleets of trucks whose practice is reasonably safe are in duty bound, says the report, to work for proper laws, and for enforcement, because of the danger to their trucks from carelessness on unregulated trucks.

The conclusions of the study include a recommendation to companies operating fleets of vehicles, and also to individuals, that they should organize their businesses to avoid excessive working hours. Drivers of private passenger cars also should realize the danger of driving when tired. There is need for agreement among the states as to laws regulating time on duty, hours and conditions of rest, etc.

Records have been made from statistics of 14 states, from which it appears that one per cent of accidents reported are caused by "driver being asleep or extremely fatigued;" 3.2 per cent, driver intoxicated or had been drinking; and 5.1 per cent, vehicle had defects or faulty equipment. It is added, however, that this latter is rarely the basic cause of the accident. This statement is often presented to conceal other causes.

Sleepiness is also a cause which those guilty of it try to cover up. As trucking on a large scale is a comparatively new industry, it is found that even in the best managed companies there is a considerable percentage of drivers who are irresponsible young men; adventurers who in former years would have been cowboys or sailors. These men have to be watched with great care. In one case, a stopover point where drivers were expected to rest in a hotel, had to be watched with care, and a night watchman had to make the rounds of the sleeping rooms every half hour, to see whether the drivers were there or were off entertaining themselves somewhere else. Matters like this form the subject of numerous chapters in this interesting pamphlet.

## I.C.C. Inquiry into Interterritorial Rate Bases

The Interstate Commerce Commission has ordered a proceeding of investigation, Ex Parte No. 116, in which interested parties and public bodies may bring to the attention of the commission their views as to the general subject of the bases for the construction of interterritorial rates, deemed proper under sound principles of ratemaking and established law. In a notice to the public the commission says that in a long series of cases before the commission many sharp differences have developed as to such principles and the methods of their application to specific problems. Among such methods the following are mentioned:

1. Add separately published factors, in in the form of locals or proportionals, to and from territorial boundry lines.

2. Find the through rates under each territorial scale as though the haul were entirely in one territory and then add mileage proportions of the rates so found, according to the miles of haul in each territory.

3. Find the through rate on the basis of applying the lowest territorial scale to the entire haul and add differentials reflecting the higher scales in other territories.

4. Find the rate from the origin to boundary line of the first territory under the scale of that territory for the length of haul therein and add to this a charge representing the progression for the added distance under the scale of the second territory based on the difference in the rate for the miles of the haul to the beginning of that territory and the rate for the miles to the destination in or boundary of that territory, and so on for all territories involved. This method gives a through rate in one direction different from that in another. These two through rates may be averaged.

5. Prepare tables which divide the rates in the scales concerned into line haul part (based on lowest rate of progression in the scale) and the remainder, which for convenience will be called a terminal factor, varying with distance. Add a line haul factor for each territory based on mileage in the territory and further add an average of the terminal factors taken from the initial and terminal territorial scales involved, such terminal factors being in each case computed for the entire distance for the through haul.

6. Make the through rate based on the scale of the destination territory.

7. The same rates per ton per mile for the entire interterritorial distance.

Briefs, conforming to the rules of practice may be filed on or before April 10. Pending the filing and consideration of such briefs, the commission will proceed with pending cases in which this general question is presented for specific application. This notice to the public "is not to be construed as indicating a view one way or the other on the question as to whether interterritorial rates can as a practical matter be made in accordance with some universal rule."

* * * *

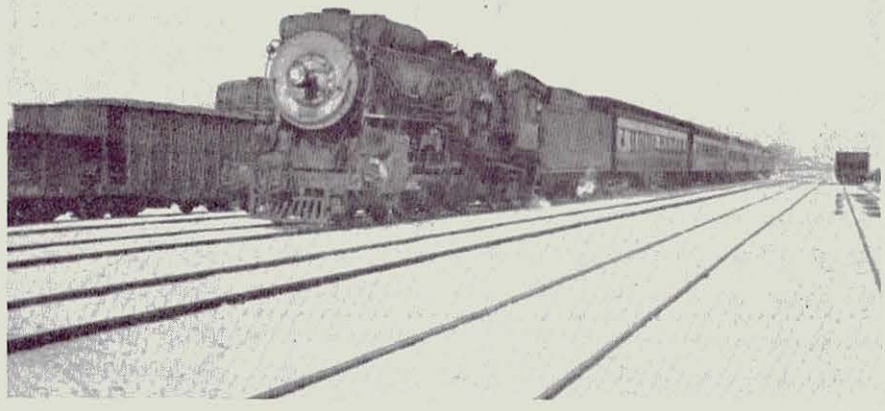


Photo by C. Parker

The New York, New Haven & Hartford's "Yankee Clipper" at Forest Hills, Mass.

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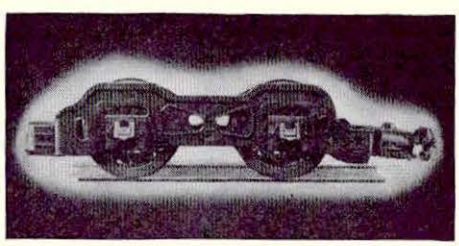
# TRAVELERS *praise* BOOSTER HANDLED TRAINS

Intensive effort is being made to encourage passenger travel:—air conditioning, improved seating, better lighting, better riding cars, and better train handling; all are receiving their share of attention.

Regardless, however, of what else is done, the smooth starting and stopping—the better handling that the Booster brings, enhances every other improvement.

Travelers praise the comfort of Booster handled trains. The extra power the Booster provides makes possible a smooth, quick start. It avoids the jar and jerk, which irritate.

By eliminating discomfort in starting, the Booster emphasizes and capitalizes all other improvements now being made to provide comfort.



In addition, it cuts down locomotive and car maintenance costs,and, due to the quick acceleration it provides,train schedules can be speeded up and more easily maintained.

*The close tolerances essential to efficient Booster operation call for genuine repair parts made by Franklin.*

**FRANKLIN RAILWAY SUPPLY COMPANY, INC.**

NEW YORK CHICAGO MONTREAL

# Equipment and Supplies

## LOCOMOTIVES

THE SEABOARD AIR LINE has ordered four locomotive tenders of 16,000 gal. capacity from the Baldwin Locomotive Works.

## PASSENGER CARS

THE ATCHISON, TOPEKA & SANTA FE is inquiring for two streamlined type, 75-ft. mail and baggage cars.

THE CHICAGO, BURLINGTON & QUINCY has placed an order with the Edward G. Budd Manufacturing Company for Zephyr train No. 4, a four-car, streamlined articulated train, which it will operate between St. Louis, Mo., and Burlington, Iowa, through Hannibal, Mo.

## IRON AND STEEL

THE ATLANTIC COAST LINE has placed an order with the Tennessee Coal, Iron & Railroad Company for 5,000 tons of 100-lb. steel rail, to be delivered at the rate of 1,000 tons a month, beginning with March, 1935.

## SIGNALING

ST. LOUIS-SAN FRANCISCO has provided in its budget, for this year, for the installation of automatic block signals on its line between Memphis, Tenn., and New Albany, Miss., a distance of approximately 75 mi. Normally throughout the year, seven regular trains in each direction are operated over this stretch every 24 hr., while during the summer months the number is increased by special passenger trains.

## AIR CONDITIONING

THE CHICAGO & EASTERN ILLINOIS will air-condition 30 parlor, sleeping and dining cars for use in its Chicago-Evansville and Florida trains.

## MISCELLANEOUS

### Burlington Budget

The 1935 budget of the Chicago, Burlington & Quincy contemplates the purchase of one Pacific type (4-6-4) passenger locomotive (order reported in the *Railway Age* of February 23); two hundred and fifty 55-ton hopper cars, five hundred 50-ton composite coal cars, two 3-unit Zephyr trains (order reported in the *Railway Age* of August 4); 1 fourth car for the Zephyr (order reported in the *Railway Age* of December 15); 2 deluxe day passenger coaches, air-conditioning for 75 passenger train cars, 16,000 tons of rails (order reported in the *Railway Age* of February 2); 9,200 tons of fastenings, 39 light-weight inspection motor cars, 3 superintendent's inspection motor cars.

# Supply Trade

**The Safety Car Heating & Lighting Company's** St. Louis, Mo., office, with **S. I. Hopkins,** manager, is now located at 915 Olive street.

**Erle G. Hill** has become associated with the **Lukens Steel Company,** Coatesville, Pa., as director of research. Mr. Hill has for a number of years been employed as a metallurgist, both in instruction and research at several universities.

**The Atlas Supply Company, Inc.,** 35 Woodward avenue, Brooklyn, N. Y., has been appointed warehouse distributors of rust-resisting Toncan Iron sheets of the **Republic Steel Corporation,** Youngstown, Ohio.

**The American Locomotive Company** has appointed the **Pacific Car & Foundry Company** of Seattle, Wash., as its sales representatives for the states of Washington, Oregon and Idaho, succeeding the Zimmerman-Wells-Brown Company of Portland, Ore.

**The National Copper Paint Company,** Chicago, has been formed to manufacture and market liquid copper paint. Officers of the company are: President, **H. M. Rice,** manager of the **Nichols Copper Company,** Chicago, a unit of the **Phelps-Dodge Corporation;** executive vice-president, **C. L. Welch;** and secretary-treasurer, **Frederick A. McLauchlan,** president of **George B. Carpenter & Co.,** Chicago.

**Knut Nordenson,** for 20 years chief designer of the **McIntosh & Seymour Corporation,** at Auburn, N. Y., has been appointed chief engineer of the company to fill the vacancy caused by the resignation of **Paul A. Ritter, Sr.,** who had been chief engineer for 10 years. Mr. Nordenson received his technical education at Tekniska Hogskolan, Stockholm, Sweden. Previous to 1915 he was designer for eight years at Aktiebolaget Atlas Diesel, Stockholm, and has also been associated with a number of other Diesel and oil engine companies. **Karl Volmar Anderson,** who for the past five years has been responsible for the design of the McIntosh & Seymour high-speed and railway type engines, has been appointed chief designer for the company. Mr. Anderson has had experience with the Cummins Engine Company, Columbus, Ind., as designer, as well as with other Diesel engine companies both in this country and in Europe. **James T. Lewis,** chief inspector of the corporation, will continue in that position and will also be in charge of field service of Diesel engines. **William N. Nichols,** who has been in charge of field service for the past eight years, is now in charge of all experiments in combustion and will also be in charge of all engine testing.

**F. A. Livingston,** who has been elected president and general manager of the **Ralston Steel Car Company,** Columbus, Ohio, has been associated with the company since January 1, 1906, when he entered its employ as secretary to the president. After holding the positions of bookkeeper and paymaster, he was appointed assistant secretary and assistant treasurer on June 7, 1911. On August 1, 1916, he was elected a director and on February 9, 1917, was elected secretary and treasurer. He held the latter position until September 15, 1923, when he was elected vice-president and treasurer, which position he has held until his recent election. Mr.

F. A. Livingston

Livingston is also president of the Mifflin Realty Company and the Ralston Scales Corporation, subsidiaries.

**Blair C. Hanna,** who has been elected manager of sales, was born in Pittsburgh, Pa., and began his business career with the Pressed Steel Car Company, holding various positions with that company from 1899 to 1908. In the latter year he was appointed chief estimator of the Ralston Steel Car Company, which position he held until 1912, when he was appointed assistant

Blair C. Hanna

to the vice-president. During 1918 and 1919, he was in military service, serving with the Department of Military Railways of the chief of engineers office at Washington, and on the completion of his military duties was appointed chief engineer of the Ralston Steel Car Company. In 1920, he was also appointed assistant to the president, which position he has held until his recent appointment.

**Thomas R. Langan,** who has been appointed traffic manager of the **Westinghouse Electric & Manufacturing Com-**

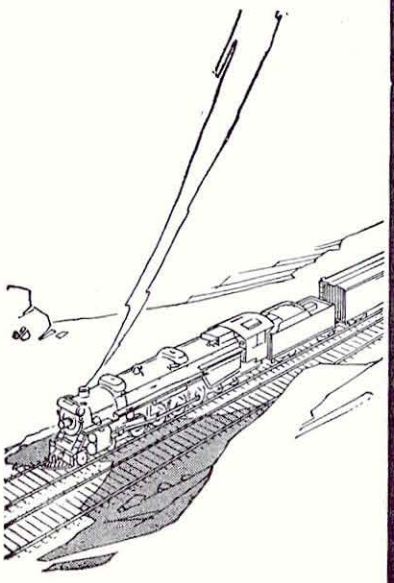
*Continued on next left-hand page*

# *Engineering Service....*

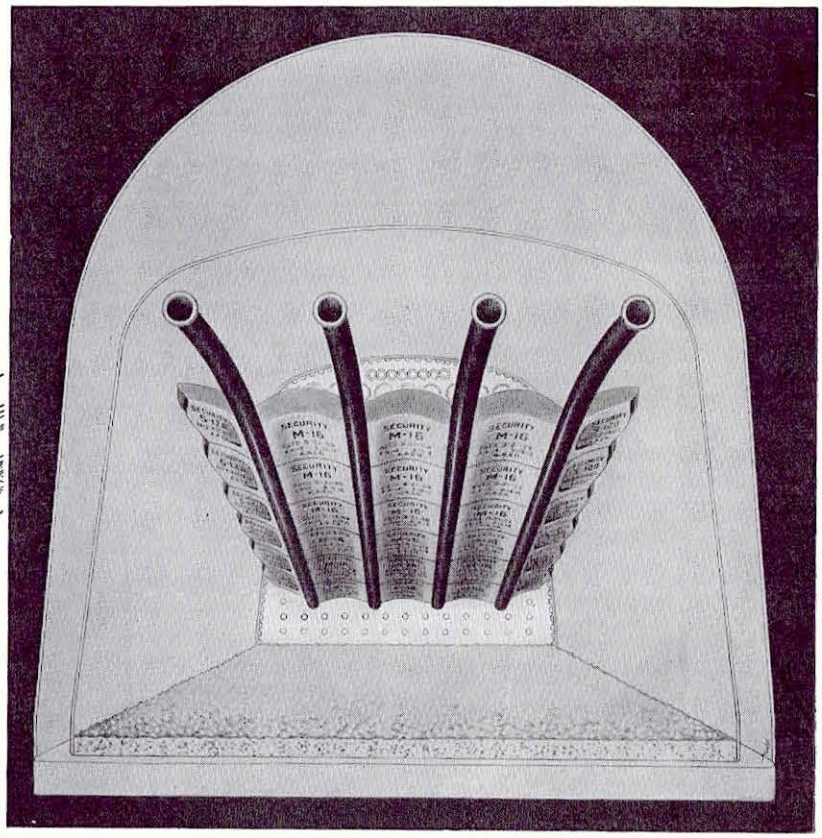
## THAT MEANS FUEL ECONOMY

FOR years, practically every new design of locomotive has had the brick arch designed by American Arch Company Engineers.

This engineering service is one of the most important elements of economical fuel combustion. Regardless of what your combustion problem may be, the engineers of the American Arch Company are ready and capable of giving you the most experienced assistance available.



*There's More To*
SECURITY ARCHES
*Than Just Brick*




**HARBISON-WALKER REFRACTORIES CO.**

***Refractory Specialists***

NRA MEMBER U.S. WE DO OUR PART

**AMERICAN ARCH CO.**
**INCORPORATED**

***Locomotive Combustion Specialists*** » » »

pany, with headquarters in the East Pittsburgh, Pa., works, studied electrical engineering at Pratt Institute and at Carnegie Institute of Technology. He entered the employ of the Westinghouse Company in 1904, first serving for two years on an engineering apprenticeship course then entered the service department and spent a number of years on road erection and repair work. Later he was engaged in activities involving special installations and operations of electric railway equipments. In 1919 he was transferred to the sales department and in 1922 was appointed manager of the Syracuse, N. Y., office. Two years later he was appointed transportation manager of the Northeastern district, with headquarters at New York, becoming sales manager of this district in 1931, the position he leaves to become traffic manager. Important operations with which Mr. Langan has been associated include, the installation and maintenance of electric locomotives on main line electrification of the New York, New Haven & Hartford; subway and elevated rapid transit train service in New York and Brooklyn; and the installation of many railway power plants and substation equipments throughout the United States. Mr. Langan is a member of many transportation associations and is a writer and speaker on railway events and activities.

Thomas R. Langan

## Westinghouse Electric & Manufacturing Company Annual Report

The annual report of the Westinghouse Electric & Manufacturing Company for the year ended December 31, 1934, shows a net income of $189,563, as compared with a net loss of $8,636,841 for 1933. These results are after provisions for depreciation and other reserves.

Sales billed for 1934 totaled $92,158,894, compared with $66,431,592 for 1933, an increase of 39 per cent. Orders received totaled $106,473,226, compared with $72,473,117 in 1933, an increase of 47 per cent. Unfilled orders at the close of the year amounted to $34,085,921, compared with $26,954,044 at December 31, 1933.

On December 31, current assets amounted to $80,328,712 and current liabilities to $6,122,180, a net working capital of $74,206,532, and a ratio of current assets to current liabilities of 13 to 1. This compared with a working capital of $69,708,232 and a ratio of 17.3 to 1 at the close of 1933. The figures are net amounts after deducting appropriate reserves.

The consolidated income and surplus account for the year 1934 follows:

| | Year Ended December 31, 1934 |
|---|---|
| Net Sales | $92,158,894 |
| Cost of Sales: Manufacturing cost and distribution, administration, and general expenses — including taxes (except federal income), service annuities, operating reserves, and depreciation of buildings and equipment | 93,426,328 |
| Loss from Sales | $1,267,434 |
| Other Charges: Current operating results of subsidiary companies not consolidated in detail | 135,285 |
| Loss from Operations | $1,402,719 |
| Income Credits: Interest, discount, and miscellaneous income, net | *$681,095 |
| Dividends and interest on investments | 1,381,215 |
| Total | $2,062,310 |
| Net Profit before foreign exchange adjustments and federal income tax provision (1933, loss) | $659,591 |
| Gain in foreign exchange values | $7,717 |
| Provision for federal income tax | 477,745 |
| Total (1934, deduction; 1933, addition) | $470,028 |
| Net Income for the year (1933, loss) | $189,563 |
| Surplus at beginning of year | 40,564,474 |
| Surplus before adjustments and dividends | $40,754,037 |
| Adjustments: Adjustment in value of securities (1934, addition; 1933, deduction) | $415,895 |
| Adjustment on Radio Corporation of America stock distributed as a dividend | ..... |
| Miscellaneous, net | 269,585 |
| Total (1934, addition; 1933, deduction) | $146,310 |
| Surplus before dividends | $40,900,347 |
| Dividends: On preferred capital stock | $279,920 |
| On common capital stock | ..... |
| Total | $279,920 |
| Surplus at end of year, including $16,293,860 paid-in surplus representing premium on sale of additional common capital stock in 1929 | $40,620,427 |

Note—Provision for plant and equipment depreciation for all companies for 1934 amounted to $5,210,848.47, compared with $5,081,299.74 for 1933.

* Includes a loss of $176,130.93 in 1934 and a profit of $493,123.90 in 1933 from the sale of Radio Corporation of America stock.

## Superheater Company Annual Report

Consolidated net earnings of $502,246 after adjustment of minority interests were reported by the Superheater Company for the year ended December 31, 1934. This figure, which is the equivalent of 57½ cents per share on the 874,054 shares of stock outstanding at the close of last year, represents an increase of $186,291 over the 1933 net earnings. The 1934 operating profit of $228,923 came after operating losses had been reported for the two preceding years. In commenting on the 1934 results the reports calls attention to the fact that the company paid total taxes in the United States and Canada amounting to $140,000 or 25½ per cent of the year's total net profit figure. It adds that this situation is illustrative "of the proportion of the tax burden which business is called upon to bear."

The report sets up a statement of working capital which shows total current assets as of December 31, 1934, to have been $9,539,597 as compared with current liabilities of $440,502 leaving a net working capital of $9,099,095. Included among the current assets is $881,638 in cash, an amount twice as great as total current liabilities.

The consolidated statement of earnings for 1934 follows:

| | |
|---|---|
| Profit from Operations | $228,923 |
| Income from Other Sources: Interest and Dividends from Investments, Bank Balances, etc. | $458,200 |
| Miscellaneous | 23,614 |
| Profit on Sale of Securities (Net) | 20,331 |
| | $502,145 |
| Depreciation | $88,991 |
| Federal, Dominion and Foreign Income Taxes | 93,471 |
| | $182,462 |
| Earnings for year 1934 | $548,608 |
| Deduct: Profit applicable to minority interests | 46,362 |
| Net Earnings—After adjustment of minority interests | $502,246 |
| Earnings per share (874,054 outstanding) | 57½c |

## General American Transportation Corporation

The annual report of the General American Transportation Corporation and its subsidiaries for 1934 shows a net profit of $2,649,577, as compared with a net profit of $1,974,558 in 1933. The consolidated summary of income and the consolidated surplus account are as follows:

| | 1934 | 1933 |
|---|---|---|
| Gross income from sales, rentals, etc. | $26,501,677 | $19,728,294 |
| Add: Dividends, interest and other income from investments | 646,633 | 337,679 |
| | $27,148,310 | $20,065,973 |
| Less: Cost of sales, expenses and all taxes | $18,692,672 | $11,799,051 |
| Interest on car equipment notes | 1,394,860 | 1,609,609 |
| Depreciation | 4,299,214 | 4,478,651 |
| Provision for dividends of subsidiaries | 111,987 | 204,104 |
| | $24,499,733 | $18,091,415 |
| Net profit | $2,649,577 | $1,974,558 |
| Balance — December 31, 1933 | $47,629,874 | $44,628,699 |
| Net profit for year ended December 31, 1934 | 2,384,641 | 1,974,558 |
| Excess over par value of $5 per share on 30,000 shares of treasury stock sold for cash | 1,009,138 | ..... |
| On 20,000 shares used to acquire properties | ..... | 320,360 |
| On 43,951 shares sold for cash | ..... | 1,271,589 |
| Discount on preferred stock retired | 2,417 | ..... |
| | $51,026,070 | $48,195,206 |
| Less 21,456 shares acquired, principally in exchange of investments | ..... | $581,745 |
| Reinstatement of cost values of marketable securities, now below market, previously written down through surplus | ..... | 802,962 |
| | $51,026,070 | $48,416,423 |
| Deductions: Dividends paid and provided for | 1,125,029 | 786,549 |
| | $49,901,041 | $47,629,874 |

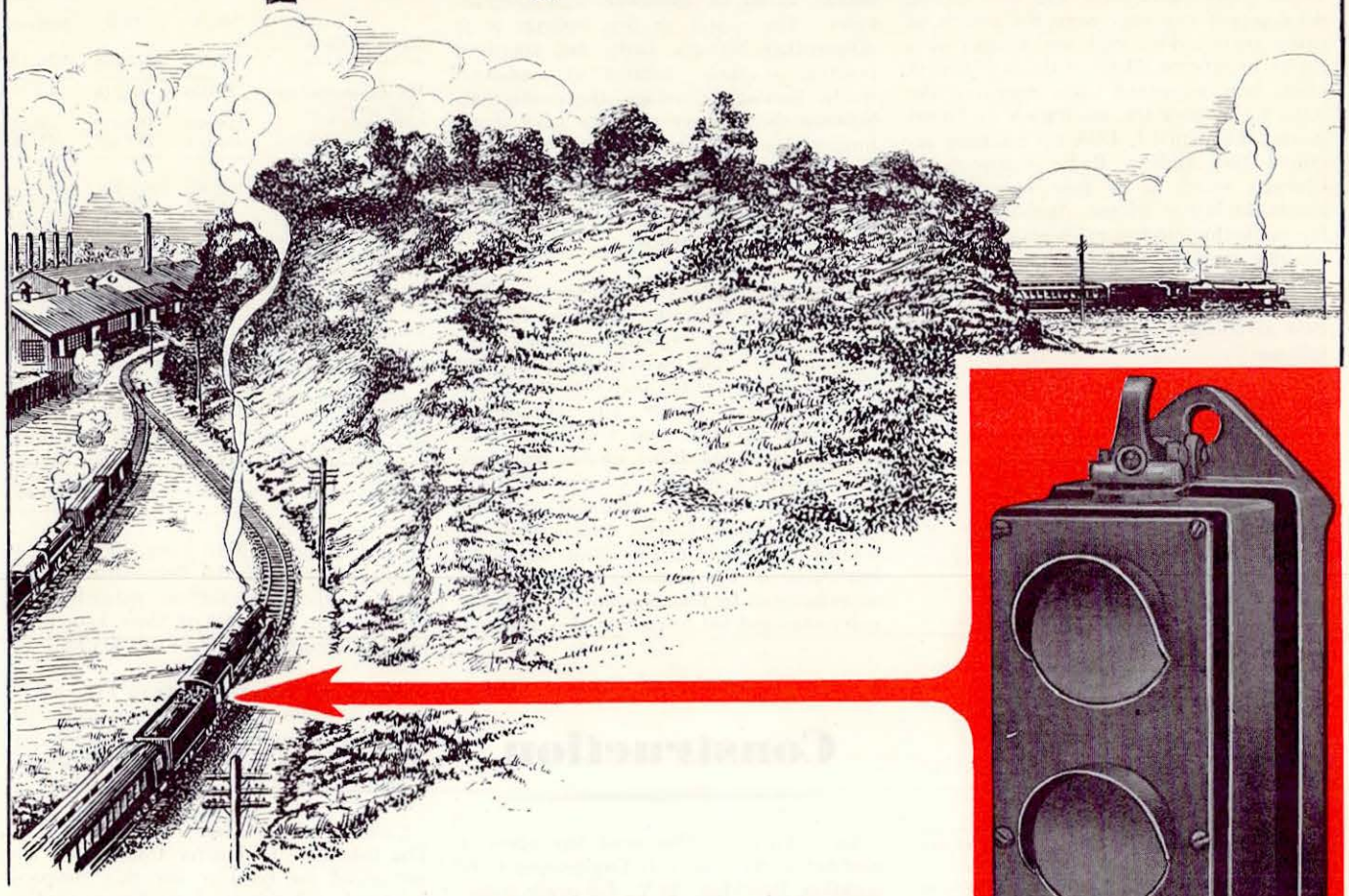
## Fairbanks, Morse & Co.

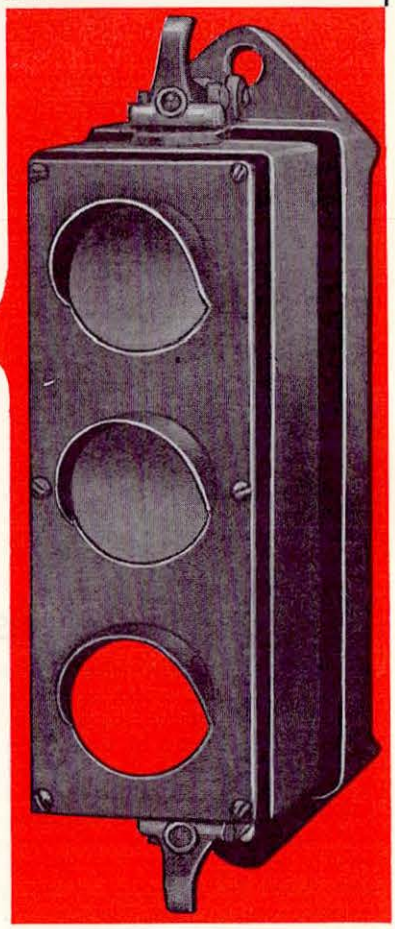
The annual report of Fairbanks, Morse & Co. shows a net profit of $563,846 for 1934, as compared with net losses of $1,147,338 in 1933 and $2,547,231 in 1932. As a result of this profit in 1934 and a

*Continued on next left-hand page*

# AFTER THE SWITCH ENGINE CLEARED THE MAIN---

## *the Cab Signal Remained "RED"*





A passenger train was stopped by wayside and cab signal indications. Proceeding slowly toward the next siding, a switch engine was seen just backing off the main line. After closing of switch, the cab signal indication remained *red*. Proceeding cautiously around a curve another train was found in the block.

In this actual experience, had the train not been equipped with continuous cab signals, the engineman might have assumed the block unoccupied after the switch engine was in the clear.

"Union" Coded Continuous Cab Signals give enginemen immediate information of changes in track conditions ahead, whether more or less restrictive.

Ask our nearest district office for details about the many operating and safety advantages of this modern signal system.

917

1881 **Union Switch & Signal Co.** 1935

SWISSVALE, PA.

NEW YORK MONTREAL CHICAGO ST. LOUIS SAN FRANCISCO

discount on debentures purchased for the sinking fund totaling $69,605, the unappropriated surplus account was increased from $3,293,400 as of December 31, 1933, to $3,926,851 as of December 31, 1934. The cash resources of the company on the latter date were twice the total current liabilities and the ratio of current assets to current liabilities was more than 8 to 1.

During the year, the company placed additional emphasis upon the development of Diesel power equipment and as a result, development expenses were the largest in many years. This cost was treated as a charge to expense. Much of the development effort was expended upon improved designs to broaden the application of Diesel power. On April 1, 1934, the company acquired the Audiola Radio Company of Chicago which it is now operating as Fairbanks-Morse Home Appliances, Inc., for marketing electric refrigerators, radios, washing machines and ironers.

A summary of the consolidated income and unappropriated surplus accounts for 1934 as compared with the previous year, follows:

| | 1934 | 1933 |
|---|---|---|
| Net sales | $12,551,466 | $8,907,945 |
| Cost of sales, selling, administrative expenses, etc. | 11,205,274 | 9,387,495 |
| Net operating profit before depreciation, interest on debentures and federal income tax | $1,346,192 | $479,550* |
| Depreciation | 536,419 | 414,788 |
| Interest on debentures | 290,269 | 313,333 |
| Federal income tax | 80,197 | ..... |
| Net profit | $439,307 | $1,207,671* |
| Net income of Municipal Acceptance Corporation | 124,539 | 60,332 |
| Consolidated net profit | $563,846 | $1,147,339* |
| *Unappropriated Surplus Account* | | |
| Balance December 31, 1933 | $3,293,400 | $4,345,535 |
| Add: Discount on debentures purchased for sinking fund | $69,605 | $95,204 |
| Consolidated net profit. | 563,846 | 1,147,339* |
| Balance | $3,926,851 | $3,293,400 |

* Loss.

## TRADE PUBLICATIONS

ELECTRICAL WIRES, CABLES AND CORDS.—A 64-page catalog, consisting of a number of bulletins in a binder, has been published under the above title by the Crescent Insulated Wire & Cable Company, Trenton, N. J. The included bulletins describe the methods used for making Crescent products, provide illustrated specifications of various types of cable and flexible cord and explain the properties of the several different types of insulation used.

RIGID FRAME CONCRETE BRIDGES.—This is a third edition of a 40-page booklet, published by the Portland Cement Association, Chicago, which presents a clear and concise discussion of the design of such structures without the use of higher mathematics. This edition contains considerable additional information including the results of recent studies. This includes a simple method of correcting moments in frames by allowing for deck curvature and important structural details used in rigid-frame concrete bridges. There is also a new convenient method of determining stresses in double-reinforced concrete sections subject to combined bending and axial thrust. A bibliography of 29 references will prove of special value to those who wish to make more extended studies of the subject.

CONCRETE BRIDGE DETAILS.—The Portland Cement Association, Chicago, has issued a 48-page treatise on concrete bridge details, based on extensive field observations. The object of this bulletin is to differentiate between faulty and approved practice in such features as expansion joints, bearings, drainage, the connections between the primary elements of a structure, and other details, where superficial consideration could lead to minor failures or deterioration in spite of the correct application of mathematics in the design of the structure as a whole.

QUELARC PLUGS AND RECEPTACLES.—The Pyle-National Company, Chicago, has issued an 11-page booklet, designated as Bulletin No. 192, which describes the Quelarc line of plugs and receptacles for air-conditioning service and pre-cooling equipment in yards and terminals. The recently developed fused service plugs are also described in this bulletin. Typical wiring diagrams for terminal stand-by cooling installations, with special reference to fuse protection, are included, as are illustrations of the plug-receptacle products manufactured by this company. Catalogue references and list prices are also included.

# Construction

LONG ISLAND.—This road has given a contract to the Faircroft Engineering Corporation, Brooklyn, N. Y., for grade crossing elimination work in St. Albans and Springfield, Long Island, at Westchester avenue (which is known also as Central avenue), Baisley boulevard, Farmers boulevard, Merrick road, Springfield boulevard, Willow place and Maple avenue. The eliminations will be accomplished by constructing at each street a concrete bridge with ornamental piers, solid concrete floors and abutments. In connection with this work a new street to be known as 120th avenue will be constructed on a dirt embankment.

NEW YORK CENTRAL.—The elimination of the Verona station crossing of this road on the Oneida Valley-State Bridge highway in Verona, Oneida county, N. Y., has been directed by the New York Public Service Commission. This is to be accomplished by raising the highway and carrying it above the grade of the railroad at the present crossing. The structure over the railroad will be a plate girder 90-ft. span with 40-ft. approach spans. The Department of Public Works estimated the construction work at $98,400 while the railroad company estimated the total cost at $155,500.

# Financial

AKRON, CANTON & YOUNGSTOWN.—*Annual Report.*—The 1934 annual report of this company shows net income, after interest and other charges, of $116,437, as compared with net income of $118,326 in 1933. Selected items from the income statement follow:

| | 1934 | 1933 | Increase or decrease |
|---|---|---|---|
| RAILWAY OPERATING REVENUES | $953,959 | $877,826 | +$76,133 |
| Maintenance of way | 75,070 | 62,816 | +12,253 |
| Maintenance of equipment | 116,459 | 117,690 | −1,230 |
| Transportation | 283,601 | 252,369 | +31,232 |
| TOTAL OPERATING EXPENSES | 592,468 | 547,133 | +45,334 |
| Operating ratio | 62.11 | 61.98 | +0.13 |
| NET REVENUE FROM OPERATIONS | 361,491 | 333,753 | +27,737 |
| Railway tax accruals | 93,197 | 71,098 | +22,099 |
| Hire of freight cars | 81,799 | 70,000 | +11,799 |
| NET RAILWAY OPERATING INCOME | 220,091 | 230,032 | −9,940 |
| Non-operating income | 349,333 | 358,721 | −9,387 |
| Interest on funded debt | 207,214 | 210,956 | −3,741 |
| TOTAL DEDUCTIONS FROM GROSS INCOME | 232,896 | 240,395 | −7,498 |
| NET INCOME | $116,437 | $118,326 | −$1,889 |

ANN ARBOR.—*R.F.C. Loan.*—The receivers have applied to the Reconstruction Finance Corporation for an extension for five years of $600,000 of their loan after making a partial payment of $34,757.

ATCHISON, TOPEKA & SANTA FE.—*Abandonment.*—This company has applied to the Interstate Commerce Commission for authority to abandon its line from Arkansas City, Kan., to South Haven, 21 miles.

CHESAPEAKE BEACH.—*Abandonment.*—The Interstate Commerce Commission has authorized the receiver for this company to abandon that part of its line extending from Seat Pleasant, Md., to Chesapeake Beach, 25.6 miles—cause, highway competition.

CHICAGO & NORTH WESTERN.—*Pooling of Ore Traffic Proposed.*—This company, the Escanaba, Iron Mountain & Western, and the Chicago, Milwaukee, St. Paul & Pacific have applied to the Interstate Commerce Commission for authority to pool the ore traffic from the Menominee range to the docks at Escanaba, Mich., and to divide the earnings therefrom.

CHICAGO UNION STATION COMPANY.—*Bonds.*—This company and its proprietary companies have applied to the Interstate Commerce Commission for authority to issue $16,000,000 of 4 per cent first mortgage bonds to replace a like amount of 6½ per cent bonds maturing in 1963 which are to be called for redemption at 110, and also an issue of $2,500,000 of guaranteed 4 per cent bonds to cover the costs of the refinancing. The application points out that by applying the interest saving the $2,500,000 of guaranteed bonds can be retired by 1943 and that thereafter there would be an interest saving of $400,000

*Continued on next left-hand page*

# Thoroughly Modern-

# to Meet Modern Power Requirements

A boiler feeding device to meet today's power requirements not only must be dependable and easy to operate, but it should provide improved operation and economy through utilization of wasted exhaust steam.

All these requirements are adequately provided by the Elesco exhaust steam injector.

Operated always on exhaust steam, when available, the Elesco exhaust steam injector returns otherwise wasted heat to the boiler through the feed water. This gives the advantages derived from exhaust-steam feed water heating: Fuel and water savings directly proportional to the amount of waste exhaust steam reclaimed and returned to the boiler. Capacity of the locomotive proportionately increased by a direct increase in boiler capacity and an increase in power because of reduced back pressure.

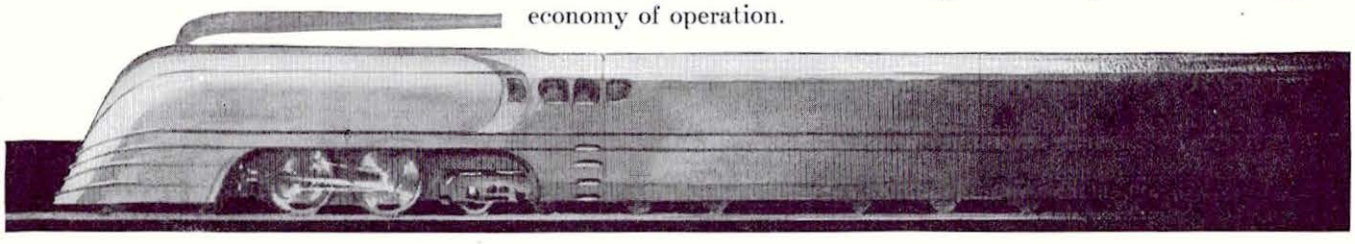
Its principle of operation is the same as a live-steam injector and, when necessary, it changes over automatically to live-steam operation. This changeover, being automatic and actuated by live-steam pressure, makes the Elesco exhaust steam injector equally as dependable as any injector boiler feed—while assuring the benefits from reclaiming waste heat.

Operation is exceedingly simple. Opening the starting valve starts it. Closing the valve stops it. Regulation of the supply of water fed to the boiler is all the other attention required.

In the Elesco exhaust steam injector, you have a boiler feeding device that is simple and reliable in operation, and provides the economies of feed water heating, so necessary for increased economy of operation.

ELESCO

*Exhaust* Steam Injector



## THE SUPERHEATER COMPANY

*Representative of* AMERICAN THROTTLE COMPANY, Inc.

60 East 42nd Street
NEW YORK

NRA MEMBER U.S. WE DO OUR PART

Peoples Gas Building
CHICAGO

A-966

**Canada: The Superheater Company, Limited, Montreal**

*Superheaters - Feed Water Heaters - Exhaust Steam Injectors - Superheated Steam Pyrometers - American Throttles*

a year, making a total saving over the life of the bonds of $8,200,000.

CLARION RIVER.—*Abandonment.*—This company has applied to the Interstate Commerce Commission, for authority to abandon its line from Hallton, Pa., to Croyland, 12 miles.

DENVER & SALT LAKE.—*Abandonment.*—This company has applied to the Interstate Commerce Commission for authority to abandon its line from Newcomb, Colo., to Vasquez, 31.76 miles.

ERIE.—*Annual Report.*—The 1934 annual report of this company shows net deficit, after interest and other charges, of $601,034, as compared with net income of $531,528 in 1933. Selected items from the income statement follow:

| | 1934 | 1933 | Increase or decrease |
|---|---|---|---|
| Average mileage Operated | 2,304,987 | 2,315,380 | −10,393 |
| RAILWAY OPERATING REVENUES | $75,064,121 | $72,086,315 | +$2,977,806 |
| Maintenance of way | 6,887,750 | 6,577,993 | +309,757 |
| Maintenance of equipment | 15,172,539 | 14,706,539 | +466,000 |
| Transportation | 26,920,467 | 25,173,897 | +1,746,569 |
| TOTAL OPERATING EXPENSES | 54,311,372 | 51,612,532 | +2,698,840 |
| Operating ratio | | | |
| NET REVENUE FROM OPERATIONS | 20,752,749 | 20,473,783 | +278,965 |
| Railway tax accruals | 3,951,598 | 3,945,986 | +5,612 |
| Railway operating income | 16,783,384 | 16,492,306 | +291,078 |
| Net equipment and joint facility rents—Dr. | 4,083,552 | 3,969,158 | +114,393 |
| NET RAILWAY OPERATING INCOME | 12,699,832 | 12,523,147 | +176,684 |
| Non-operating income | 2,373,238 | 4,196,774 | −1,823,536 |
| GROSS INCOME | 15,073,070 | 16,719,922 | −1,646,851 |
| Rent for leased roads | 2,179,486 | 2,171,511 | +7,974 |
| Interest on funded debt | 12,197,023 | 12,552,191 | −355,168 |
| TOTAL DEDUCTIONS FROM GROSS INCOME | 15,674,104 | 16,188,393 | −514,288 |
| NET INCOME | * $601,034 | $531,528 | −$1,132,563 |

* Deficit

MINNEAPOLIS & ST. LOUIS.—*Foreclosure sale.*—The foreclosure sale of the Minneapolis & St. Louis, scheduled for March 13, has been postponed until April 12, due to the fact that bidders failed to file intentions within the prescribed time. On March 15, representatives of the eight western roads met with Jesse Jones, chairman of the Reconstruction Finance Corporation, to discuss their plans for taking over the line. While the plan of these roads has not been made public, a parceling out of the line among the eight railroads has been suggested and as a result, representatives of communities and employee organizations in the four states served by the Minneapolis & St. Louis are opposing dismemberment. It has been decided that as soon as formal application is made by the eight roads, opposition will be formally registered and hearings requested in Minnesota, South Dakota, Iowa and Illinois. The Springfield, Ill., Chamber of Commerce, on recommendation of its traffic department, has sent a letter of protest to Federal Judge W. F. Booth of Minneapolis, asserting that any disposition of the railroad which would dismember it, particularly the section from Peoria, Ill., to the Twin Cities, would be very detrimental to shipping interests and the public at large in Springfield and many other Illinois communities which are served by the M. & St. L.

MAINE CENTRAL.—*Abandonment.*—The Interstate Commerce Commission has authorized this company to abandon a part of a branch line extending from Woodland Junction, Me., to Princeton, 10.5 miles.

MAINE CENTRAL.—*Annual Report.*—The 1934 annual report of this company shows net income, after interest and other charges, of $35,251, an increase of $15,966 over net income for 1933. Selected items from the income statement follow:

| | 1934 | Increase or Decrease |
|---|---|---|
| RAILWAY OPERATING REVENUES | $10,931,066 | +$374,631 |
| Maintenance of way | 1,665,784 | +215,620 |
| Maintenance of equipment | 1,737,545 | +891 |
| Transportation | 4,027,010 | +215,209 |
| TOTAL OPERATING EXPENSES | 8,000,144 | +425,516 |
| Operating ratio | 73.19 | +1.44 |
| NET REVENUE FROM OPERATIONS | 2,930,922 | −50,885 |
| Railway tax accruals | 1,441 | +737 |
| Railway operating income | 2,356,015 | −70,569 |
| Hire of freight Cars—Dr. | 215,179 | +40,431 |
| NET RAILWAY OPERATING INCOME | 1,838,069 | −95,033 |
| Non-operating income | 353,288 | +89,561 |
| GROSS INCOME | 2,191,358 | −5,472 |
| Rent for leased roads | 750,580 | −38,125 |
| Interest on funded debt | 1,265,499 | +52,807 |
| TOTAL DEDUCTIONS FROM GROSS INCOME | 2,156,106 | −21,439 |
| NET INCOME | $35,251 | +$15,966 |

MISSOURI-KANSAS-TEXAS.—*Bonds.*—The Interstate Commerce Commission has authorized this company to issue $13,152,638 of prior lien mortgage 5 per cent, series E, bonds to be pledged and repledged as collateral security for short term notes at the ratio of not exceeding $125 of bonds for $100 of notes.

NEW YORK, CHICAGO & ST. LOUIS.—*New Trustee Appointed for W. & L. E. Stock.*—The Interstate Commerce Commission has approved the appointment by this company of J. Crawford Biggs, who has just resigned as solicitor general of the United States, as trustee for its holdings of the stock of the Wheeling & Lake Erie, succeeding E. R. Fancher, deceased. The Reconstruction Finance Corporation, with which certificates of deposit representing the stock have been pledged as collateral for a loan, has approved the appointment. The Nickel Plate had previously asked the commission to approve the appointment of G. A. Tomlinson, but withdrew its request after a protest had been filed by F. E. Taplin, president of the Pittsburgh & West Virginia. Later it had asked approval of the appointment of James R. Garfield.

NEW YORK, ONTARIO & WESTERN.—*Annual Report.*—The 1934 annual report of this company shows net deficit, after interest and other charges, of $78,420, a decrease of $451,002 as compared with net income in 1933. Selected items from the income statement follow:

| | 1934 | Increase or decrease compared 1933 |
|---|---|---|
| RAILWAY OPERATING REVENUES | $9,389,830 | −$254,692 |
| Maintenance of way | 1,096,481 | −31,335 |
| Maintenance of equipment | 1,667,729 | +7,786 |
| Transportation—Rail | 3,851,755 | +114,849 |
| TOTAL OPERATING EXPENSES | 7,088,040 | +109,361 |
| Operating ratio | 75.49 | +3.13 |
| NET REVENUE FROM OPERATIONS | 2,301,790 | −364,054 |
| Railway tax accruals | 437,341 | −1,236 |
| Railway operating income | 1,860,614 | −365,512 |
| Hire of freight cars—Dr. Equipment rents | 530,237 | +89,154 |
| NET RAILWAY OPERATING INCOME | 1,252,077 | −456,734 |
| Non-operating income | 244,463 | −8,065 |
| GROSS INCOME | 1,496,541 | −464,800 |
| Rent for leased roads | 238,363 | +3,032 |
| Interest on funded debt | 1,218,855 | −6,258 |
| TOTAL DEDUCTIONS FROM GROSS INCOME | 1,574,961 | −13,797 |
| NET INCOME (Deficit) | $78,420 | −$451,002 |

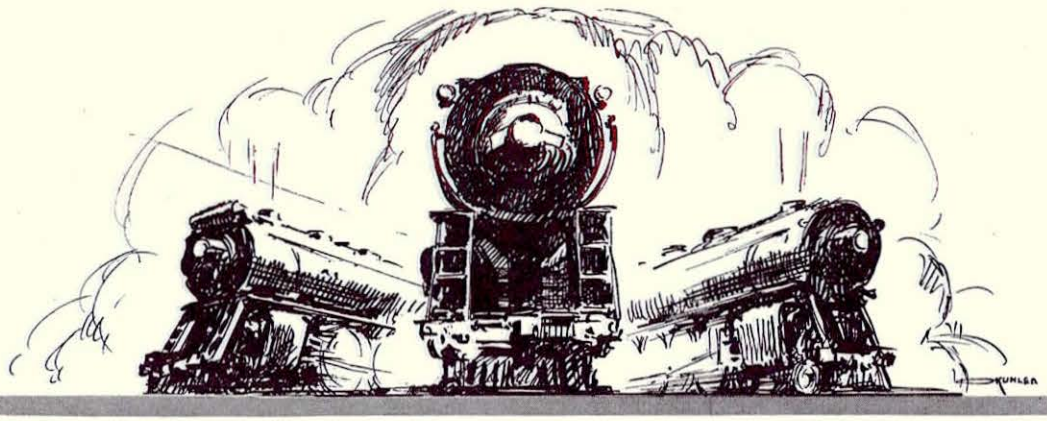
NEW YORK, SUSQUEHANNA & WESTERN. *Annual Report.*—The 1934 annual report of this company shows net deficit, after interest and other charges, of $385,038, as compared with net deficit of $416,880 in 1933. Selected items from the income statement follow:

| | 1934 | 1933 | Increase or Decrease |
|---|---|---|---|
| RAILWAY OPERATING REVENUES | $3,606,659 | $3,332,694 | +$273,965 |
| Maintenance of way | 427,789 | 368,084 | +59,705 |
| Maintenance of equipment | 687,857 | 668,465 | +19,392 |
| Transportation | 1,436,511 | 1,347,744 | +88,766 |
| TOTAL OPERATING EXPENSES | 2,748,993 | 2,581,122 | +167,871 |
| Operating ratio | 76.22 | 77.45 | −1.23 |
| NET REVENUE FROM OPERATIONS | 857,665 | 751,572 | +106,093 |
| Railway tax accruals | 261,775 | 280,366 | −18,591 |
| Railway operating income | 593,152 | 470,025 | +123,126 |
| Net equipment and joint facility rents—Dr. | 249,966 | 161,366 | +88,599 |
| NET RAILWAY OPERATING INCOME | 343,185 | 308,658 | +34,526 |
| Non-operating income | 72,893 | 80,370 | −7,476 |
| GROSS INCOME | 416,079 | 389,029 | +27,050 |
| Rent for leased roads | 26,604 | 26,371 | +232 |
| Interest on funded debt | 756,582 | 757,317 | −735 |
| TOTAL DEDUCTIONS FROM GROSS INCOME | 801,117 | 805,910 | −4,792 |
| NET DEFICIT | 385,036 | 416,880 | −31,842 |

PENNSYLVANIA.—*Abandonment.*—The Interstate Commerce Commission has authorized the Pittsburgh, Cincinnati, Chicago & St. Louis and the Pennsylvania to abandon a branch line extending from a point near Cecil, Pa., to the terminus of the line, 1.9 miles.

PENNSYLVANIA.—*Equipment Trust Certificates.*—This company has applied to the Interstate Commerce Commission for a

*Continued on next left-hand page*



AMERICAN LOCOMOTIVE CO.

"DURING the last 15 or 20 years locomotive steam pressures have been advanced from around 200 pounds to as high as 850. Every part of the unit has come in for redesign or other improvement, with the result that the service thermal efficiency of new units is approximately double that of those built 20 years ago. Meanwhile, runs between division points have been increased from 100 or 150 miles to 500, 600, 700, even above 800 miles, and the mileage covered between overhaulings has been increased around 10 times, so that today many passenger locomotives go 300,000 miles without a general shopping.

Accordingly, though I repeat that we are equipped, and it is our job, to give our customers whichever power unit is for them most economic, all things considered, I judge that the steam locomotive is a long way from done for; may well increase the respect and affection railroad men have for it; will gain, rather than lose, from the competition of the new main-line unit, the oil-electric."

*By William C. Dickerman*
*In Scientific American*

30 CHURCH ST. NEW YORK, N.Y.

supplemental order authorizing the issuance of $15,282,000 of 4 per cent equipment trust certificates to be delivered to the Public Works Administration in connection with the acquisition of 7,000 freight cars. The commission had authorized an issue of not exceeding $17,000,000 pending determination of the exact amount by final accounting.

### Average Prices of Stocks and of Bonds

| | Mar. 19 | Last week | Last year |
|---|---|---|---|
| Average price of 20 representative railway stocks.. | 28.71 | 28.05 | 45.83 |
| Average price of 20 representative railway bonds.. | 71.35 | 71.48 | 78.32 |

### Dividends Declared

Dover & Rockaway.—$3.00, semi-annually, payable April 1 to holders of record March 30.

Joliet & Chicago.—$1.75, quarterly, payable April 1 to holders of record March 30.

Norwich & Worcester.—Preferred, $2.00, quarterly, payable April 1 to holders of record March 11.

Providence & Worcester.—$2.50, quarterly, payable April 1 to holders of record March 13.

Vermont & Massachusetts.—$3.00, semi-annually, payable April 8 to holders of record March 12.

# Railway Officers

## TRAFFIC

**Norman J. Thomson,** assistant to the manager of the industrial department of the Canadian National, has been appointed commissioner of industries, at Montreal, Que., with jurisdiction over central region territory east of, but not including, Napanee, Ont., Bannockburn, Algonquin Park, Brent and Cochrane. He succeeds the late **S. George Tiffin.**

**M. H. McEwen,** general agent for the Chicago, Milwaukee, St. Paul & Pacific, at New York, has been appointed general northwestern freight agent, at Minneapolis, Minn., succeeding **C. L. Kennedy,** who, at his own request, has been appointed special representative at the same point. **J. H. Becker,** traveling freight and passenger agent at Dallas, Tex., has been appointed general agent at Atlanta, Ga., succeeding **E. K. Garrison,** who has been transferred to Philadelphia, Pa., where he replaces **A. H. Murphy,** who has been transferred to New York to succeed Mr. McEwen.

**Herbert W. Ward,** formerly a soliciting freight agent on the Chicago, St. Paul, Minneapolis & Omaha, who has been appointed general freight agent in charge of solicitation of the Minneapolis & St. Louis, as noted in the *Railway Age* of March 16, was born on April 23, 1894, at Spooner, Wis. Mr. Ward was educated in law at the Minnesota College of Law, receiving the degree of LL. B. in 1934 and being admitted to the bar in October of the same year. He first entered railway service in October, 1908, in the tariff department of the Minneapolis & St. Louis, then going with the Chicago, St. Paul, Minneapolis & Omaha two years later as a clerk in the local freight office at Minneapolis, Minn. From 1911 to 1917, Mr. Ward served as a brakeman, then being promoted to freight conductor. In 1924 he returned to the traffic department as traveling freight agent at Duluth, Minn., being appointed soliciting freight agent at Minneapolis in 1930. He was holding the latter position at the time of his recent appointment as general freight agent on the M. & St. L., with headquarters at Minneapolis.

**L. H. Trimble,** who has been appointed general freight and passenger agent on the Southern Pacific at Phoenix, Ariz., as noted in the *Railway Age* of February 9, was born on May 15, 1888, at Ft. Worth, Tex. Mr. Trimble first entered railway service in August, 1905, with the St. Louis-San Francisco. In 1910 he went with the El Paso & Southwestern (now part of the Southern Pacific) as a clerk,

L. H. Trimble

being advanced to traveling freight and passenger agent at El Paso, Tex., in 1913. Two years later he was made commercial agent at Tucson, Ariz., and in 1917 he was appointed superintendent of safety at El Paso. In March, 1920, Mr. Trimble was appointed general agent at Phoenix, later being transferred to Los Angeles, Cal. Following the absorption of the E. P. & S. W. by the Southern Pacific in 1925, Mr. Trimble was appointed a special representative in the traffic department of the latter company at Los Angeles. Two years later he was appointed general agent, perishable traffic, and in 1929 he was sent to Detroit, Mich., as general agent, which position he was holding at the time of his recent appointment.

* * *

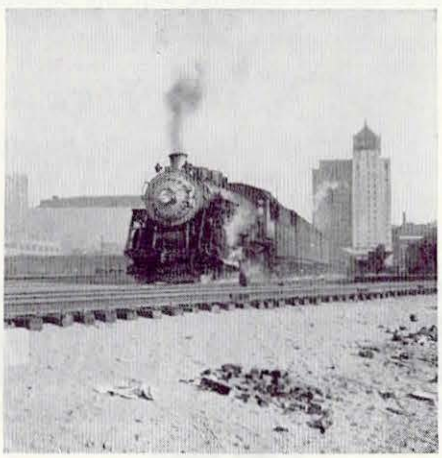


Photo by C. Parker

The Boston & Maine's "Minute Man" Leaving Boston, Mass.

## FINANCIAL, LEGAL AND ACCOUNTING

**J. H. Mitchell,** chief land appraiser in the valuation department of the New York Central at New York, has been appointed land and tax agent of the New York Central and affiliated lines, with headquarters at Chicago, succeeding **F. W. Glennon,** deceased.

**R. M. Bell,** formerly associated with the Richmond, Fredericksburg & Potomac, the Chesapeake & Ohio and the Southern, has been appointed auditor of the Virginia Central, succeeding **V. R. Krueger,** who has resigned to accept a position with the government.

**J. J. O'Connell** has been elected secretary of the Washington, Idaho & Montana, with headquarters at Potlatch, Ida., succeeding **C. R. Musser. H. L. Torsen** has been elected treasurer with headquarters at Lewiston, Ida., succeeding **F. K. Weyerhaeuser.**

**A. N. Whitlock** has been appointed general attorney for the Chicago, Milwaukee, St. Paul & Pacific at Seattle, Wash., succeeding **F. M. Dudley,** deceased. Mr. Whitlock is a member of Murphy & Whitlock, solicitors for the Milwaukee for Montana at Missoula.

## MECHANICAL

**E. G. Bowie,** master mechanic of the Saskatchewan district of the Canadian Pacific, with headquarters at Moose Jaw, has been appointed master mechanic of the British Columbia district.

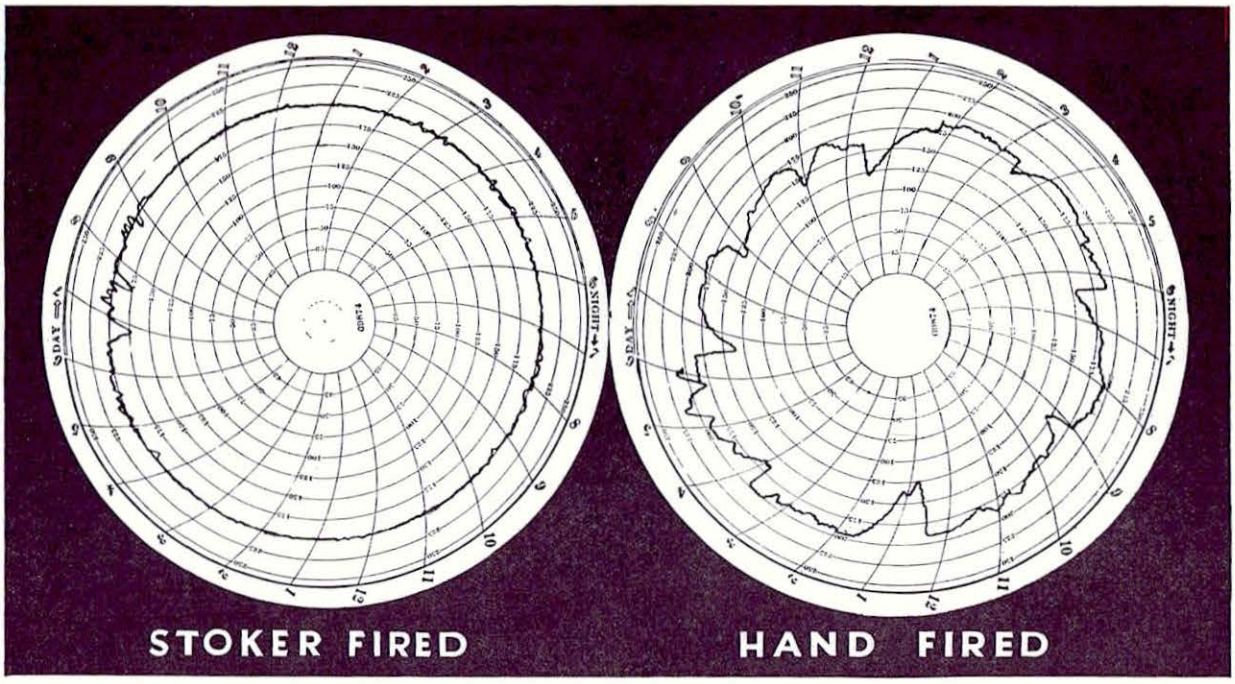
## OPERATING

**Charles P. Cahill,** formerly assistant superintendent of the Colorado division of the Union Pacific, has been promoted to superintendent, with headquarters as before at Denver, Colo., succeeding **W. C. Wolcott,** who has retired because of ill health. Mr. Cahill has been acting superintendent of this division since December 20, 1934, when Mr. Wolcott became ill. **J. M. Guild,** trainmaster at Denver, has been appointed superintendent at that point to succeed Mr. Cahill.

**Edward James Walker,** whose appointment as superintendent for the Quebec Central at Sherbrooke, Que., was noted in the *Railway Age* of March 9, was born on September 20, 1885, at London, Ont. Mr. Walker entered railroad service in November, 1900, with the Canadian Pacific as call boy at Owen Sound, Ont. In September, 1901, he became clerk in the mechanical department at Owen Sound, being appointed brakeman at Toronto Junction the following year. From April,

*Continued on next left-hand page*

**BULLETIN 3**




# HAND FIRING IS *Expensive* FIRING

In Bulletin No. 2 we showed the difference in superheat as between hand and stoker firing on an engine equipped with Type A superheater. In this bulletin we show the difference in pressure.

The fireman tried hard, did his best but conditions on the road are different from what they are in a test plant. No fireman can duplicate in road service the performance of a modern Mechanical Stoker properly handled.

TYPE "BK" STOKER

## THE STANDARD STOKER COMPANY, INC.

NEW YORK • CHICAGO • ERIE

1907, to November, 1932, Mr. Walker served as conductor at Toronto Junction, acting assistant superintendent at Smith's Falls, Ont., assistant superintendent at Smith's Falls and assistant superintendent at Farnham, Que. In November, 1932, Mr. Walker was appointed assistant superintendent at Toronto, Ont., the position he held at the time of his recent appointment.

## ENGINEERING AND SIGNALING

**Daniel J. Brumley,** chief engineer, Chicago Terminal improvements, of the Illinois Central, with headquarters at Chicago, will retire on April 1, after 30 years' continuous service with this road. He was born on March 19, 1865, at Belmore, Ohio, and received his higher education at Ohio State University, from which he graduated in 1895. Mr. Brumley first entered railway service on June 18, 1895, as an assistant track foreman on the Louisville & Nashville. After a short period of service in 1896 with the Columbus & Hocking Valley Coal & Iron Company, he returned to the L. & N. as assistant supervisor at Belleville, Ill., then serving successively at various points as a track foreman, rodman

Daniel J. Brumley

and assistant engineer until 1901. For a short period in that year Mr. Brumley served as a roadmaster on the Mexican National (now National of Mexico) at Laredo, Tex., then returning to the L. & N. as roadmaster at Elizabethtown, Ky. Three years later Mr. Brumley went with the Indianapolis Southern (part of the Illinois Central) as division engineer at Indianapolis, Ind. In March, 1905, he was appointed principal assistant engineer of the Illinois Central at Chicago. Five years later he was made engineer of construction and in April, 1913, he was appointed engineer maintenance of way. In November of the same year Mr. Brumley was advanced to assistant chief engineer and in April, 1914, he was appointed valuation engineer. During federal control of the railroads Mr. Brumley served as chief corporate engineer and on March 1, 1920, he was made chief engineer in charge of electrification and other improvements in the Chicago Terminal zone, which position he held until his retirement. Mr. Brumley has been especially active in civic and professional affairs, serving among other capacities as president of the American Railway Engineering Association in 1927-28 and of the Western Society of Engineers in 1932-33.

# Annual Report

## Delaware, Lackawanna & Western Railway Company

New York, March 1, 1935.

To the Stockholders of the
Delaware, Lackawanna and Western
Railroad Company:

A report of the operations of the railroad and other property of your Company for the year 1934, showing in appropriate schedules details of operating results, property changes and other matters of interest, is respectfully submitted.

There was an improvement in volume of traffic during the present year, resulting in increased operating revenues of $1,253,251, and although the additional revenues did not measure up to the hopes of your Management, it is worthy of note that this is the first upward annual trend in revenues since the year 1929.

The operating revenues of the first six months of the current year were substantially greater than for the same period of the preceding year, but a recession in traffic movement, which became noticeable in July and continued throughout the remaining months, absorbed a large portion of the gains realized in the earlier months.

The net railway operating income of your Company increased over the previous year 29½%, and the net income after fixed interest and rental charges, but before deduction for equipment depreciation and property retirements charged to operating expenses, was $625,345, as compared with a deficit of $220,057 in 1933. The deficit after all charges was $1,972,613, as compared with $2,993,862 in the previous year.

No major changes in rates and fares were ordered by the Interstate Commerce Commission during the year, but minor changes and adjustments in rates, mostly downward, were made, as in previous years. These reductions, although individually small, tended in the aggregate seriously to deplete the revenues of your Company. An example of the cumulative effect of such downward adjustments is afforded by comparing the average rates and fares realized in the year 1934 with similar averages of 1929. Had the average rates and fares of 1929 been in effect during 1934, your Company's revenues would have been greater by upwards of four and one-half million dollars.

A further substantiation of the sapping effect on revenues of the downward freight rate adjustments is to be found in a comparison of the traffic units handled and revenue derived therefrom in the two periods, from which it appears that while the revenue ton-mile performance of 1934 was 58% of that of 1929, the revenue of the present year was only 54% of the revenue of 1929.

Applying the same comparison to passenger service units and revenues, the revenue passengers carried one mile in 1934 were 70% of like performance in 1929, but the passenger revenue received in the present year was only 58% of the revenue of 1929.

Revenues from transportation of anthracite coal, general freight, passenger and express business, all show increases over those of the previous year. The comparison of freight revenues is unfavorably disturbed by inclusion in the previous year of $724,297 in revenue derived from the so-called emergency revenue tariff in effect for the first nine months of 1933.

Revenue from milk transportation decreased $258,769, due in part to reduced volume of shipments, but in larger measure to the reduced rates in effect for the entire year 1934, but for only seven months of the preceding year.

Revenues from operation of the ferries and from other miscellaneous sources were as a whole fairly satisfactory and approximately the same as for 1933.

Total cost of operation in 1934 increased over the preceding year $729,664, which increase may be explained briefly as follows:

The national agreement between the railroads and the Railway Labor Executives Association for a 10% reduction in wages effective from February 1, 1932, to January 31, 1933, was extended by various supplemental agreements to June 30, 1934; and by a further agreement effective July 1, 1934, a restoration in pay of 2½% of the basic rates was made, to be followed by a further restoration of 2½% effective January 1, 1935, and the balance of 5% effective April 1, 1935. The effect of the restoration for the last six months of the year was to increase operating expenses approximately $300,000.

The balance of increased operating costs amounting to approximately $429,664 was mainly due to increased cost of fuel and other materials and supplies brought about by higher prices fixed in codes established by agreements between various industries and the Federal Government.

There were laid in replacement during the year 263,539 cross ties and 12,743 tons of steel rail.

The charge to operating expenses for accrued depreciation of equipment was $2,597,958, which compares with average annual charges of $2,677,615 during the calendar years 1925 to 1929 inclusive.

Expenditures for repairs and renewals, necessary to maintain your Company's roadbed, structures and equipment in a good state of preservation and serviceability, were made during the year.

A comparison of transportation performance in 1934 with that of the previous year, indicated by revenue ton-miles and revenue passenger-miles, follows:

[Advertisement]

# GENERAL BALANCE SHEET, DECEMBER 31, 1934 AND 1933

## ASSETS

| | 1934 | 1933 | Increase or *decrease* |
|---|---|---|---|
| **INVESTMENTS:** | | | |
| Investment in road and Equipment: | | | |
| Road | $54,712,527.93 | $54,773,406.90 | *$60,878.97* |
| Equipment | 86,087,383.82 | 66,638,746.61 | 19,448,637.21 |
| Improvements on leased railway property | 15,877,206.33 | 16,251,028.18 | *373,821.85* |
| Miscellaneous physical property | 2,274,259.95 | 2,281,175.95 | *6,916.00* |
| Investments in affiliated companies: | | | |
| Stocks | 9,487,154.37 | 9,485,171.37 | 1,983.00 |
| Bonds | 3,355,815.50 | 3,370,791.75 | *14,976.25* |
| Notes | 3,772,964.42 | 3,772,964.42 | ..... |
| Advances | 4,727,199.90 | 4,411,807.10 | 315,392.80 |
| Other investments: | | | |
| Stocks | 1,592,673.06 | 1,262,837.57 | 329,835.49 |
| Bonds | *11,882,675.70 | 25,516,642.21 | *13,633,966.51* |
| Notes | 627,772.11 | 630,457.11 | *2,685.00* |
| Advances | 13,405,229.71 | 12,660,375.55 | 744,854.16 |
| Miscellaneous | 20,724.23 | 3,844.27 | 16,879.96 |
| Total investments | $207,823,587.03 | $201,059,248.99 | ..... |
| **CURRENT ASSETS:** | | | |
| Cash | $3,131,389.37 | $4,212,061.86 | *1,080,672.49* |
| Time drafts and deposits | ..... | 50,000.00 | *50,000.00* |
| Special deposits | 144,828.27 | ..... | 144,828.27 |
| Loans and bills receivable | 25,476.96 | 17,456.00 | 8,020.96 |
| Traffic and car service balances receivable | 939,821.33 | 823,749.14 | 116,072.19 |
| Net balances receivable from agents and conductors | 817,188.18 | 741,696.24 | 75,491.94 |
| Miscellaneous accounts receivable | 906,703.21 | 1,074,580.57 | *167,877.36* |
| Materials and supplies | 2,060,175.26 | 1,828,073.25 | 232,102.01 |
| Other current assets | 19,691.54 | ..... | 19,691.54 |
| Total current assets | $8,045,274.12 | $8,747,617.06 | ..... |
| **DEFERRED ASSETS:** | | | |
| Working fund advances | $27,315.71 | $27,977.50 | *661.79* |
| Insurance and other funds | 180,448.45 | 178,512.75 | 1,935.70 |
| Other deferred assets | ..... | 100.00 | *100.00* |
| Total deferred assets | $207,764.16 | $206,590.25 | ..... |
| **UNADJUSTED DEBITS:** | | | |
| Rents and insurance premiums paid in advance | $600,307.59 | $614,359.76 | *14,052.17* |
| Other unadjusted debits | 364,092.59 | 84,947.81 | 279,144.78 |
| Total unadjusted debits | $964,400.18 | $699,307.57 | ..... |
| Grand total | $217,041,025.49 | $210,712,763.87 | $6,328,261.62 |

* Pledged $1,501,000.
Figures in italics denote decrease.

## LIABILITIES

| | 1934 | 1933 | Increase or *decrease* |
|---|---|---|---|
| **CAPITAL STOCK:** | | | |
| Common stock | $87,407,500.00 | $87,407,500.00 | ..... |
| Less held by company | 2,966,300.00 | 2,966,300.00 | ..... |
| | $84,441,200.00 | $84,441,200.00 | ..... |
| Premium on capital stock | 70,720.00 | 70,720.00 | ..... |
| Total stock | $84,511,920.00 | $84,511,920.00 | ..... |
| **LONG TERM DEBT:** | | | |
| Funded debt unmatured | $70,000.00 | $70,000.00 | ..... |
| Less held by company | 55,000.00 | 55,000.00 | ..... |
| | $15,000.00 | $15,000.00 | ..... |
| Equipment trust obligations | 4,053,000.00 | ..... | $4,053,000.00 |
| Non-negotiable debt to affiliated companies: | | | |
| Open accounts | 343,724.94 | 461,639.32 | *117,914.38* |
| Total long term debt | $4,411,724.94 | $476,639.32 | ..... |
| **CURRENT LIABILITIES:** | | | |
| Loans and bills payable | $1,100,000.00 | $14,379,780.21 | *13,279,780.21* |
| Traffic and car service balances payable | 1,123,109.11 | 1,032,929.94 | 90,179.17 |
| Audited accounts and wages payable | 2,214,450.17 | 2,360,281.50 | *145,831.33* |
| Miscellaneous accounts payable | 184,179.21 | 4,503.59 | 179,675.62 |
| Interest matured unpaid | 450.00 | 450.00 | ..... |
| Dividends matured unpaid | 45,769.50 | 46,383.00 | *613.50* |
| Unmatured interest accrued | 6,266.34 | 9,354.39 | *3,088.05* |
| Unmatured rents accrued | 1,778,529.87 | 1,679,446.19 | 99,083.68 |
| Other current liabilities | 141,459,38 | 139,600.41 | 1,858.97 |
| Total current liabilities | $6,594,213.58 | $19,652,729.23 | ..... |
| **DEFERRED LIABILITIES:** | | | |
| Other deferred liabilities | $13,147,702.96 | $50.00 | 13,147,652.96 |
| **UNADJUSTED CREDITS:** | | | |
| Tax liability | $2,402,262.83 | $1,557,746.56 | 844,516.27 |
| Insurance and casualty reserves | 815,184.09 | 802,590.98 | 12,593.11 |
| Operating reserves | 75,000.00 | 105.76 | 74,894.24 |
| Accrued depreciation — equipment | 38,804,612.87 | 37,875,763.71 | 928,849.16 |
| Other unadjusted credits | 1,084,823.50 | 229,918.31 | 854,905.19 |
| Total unadjusted credits | $43,181,883.29 | $40,466,125.32 | ..... |
| **CORPORATE SURPLUS:** | | | |
| Additions to property through income and surplus | $6,584,410.56 | $6,649,454.92 | *65,044.36* |
| Appropriated surplus not specifically invested | 417,048.20 | 417,048.20 | ..... |
| Profit and loss — Credit balance | 58,192,121.96 | 58,538,796.88 | *346,674.92* |
| Total corporate surplus | $65,193,580.72 | $65,605,300.00 | ..... |
| Grand total | $217,041,025.49 | $210,712,763.87 | $6,328,261.62 |

Figures in italics denote decrease.

A general audit of the accounts of your Company and its subsidiaries as of the close of business December 31, 1934, was made by Messrs. Haskins & Sells, Certified Public Accountants, and a detailed statement of the results of their investigations was submitted February 18, 1935, with the following letter:

"Our audit (except for details that do not seem to us necessary) has covered the transactions of the company during the year ended December 31, 1934, and has found them to be correct. In our opinion, the methods employed and the safeguards surrounding all transactions are thorough and businesslike."

| | 1934 | 1933 |
|---|---|---|
| Revenue Ton-Miles | 2,662,321,663 | 2,497,525,358 |
| Revenue Passenger-Miles | 429,765,249 | 428,415,662 |

There was an increase in payments for loss and damage to shipments in transit, caused in large measure by the higher price levels that prevailed for many of the commodities handled. Another principal cause is loss from pilferage of shipments or parts thereof while the goods are in transit or at receiving and delivering points. These thefts have increased substantially during the year, notwithstanding the vigilance of the Company's special agents in endeavoring to protect the property of shippers entrusted to it for transportation.

The ratio of loss and damage to the gross freight revenue of 1934 was .47%, compared with .37% in 1933 and .47% in 1932.

Claims paid for injuries to employes and others were slightly less than in the previous year.

Your Company sold, on a favorable basis, $13,639,000 par value of New York, Lackawanna and Western First and Refunding 4% Bonds of 1973 previously held in its treasury, and with the proceeds, together with $520,315 appropriated from its available cash, liquidated its bank loan of $13,000,000. The Companys ordinary cash receipts made it unnecessary to borrow additional money from the banks during the year.

Induced by the low interest rate of 4% commencing one year after the date of issue, your Company sold to the Federal Government trust certificates not to exceed in the aggregate $4,666,000, to finance the acquisition of 20 steam locomotives, 4 Diesel electric locomotives, 500 steel hopper cars; the rebuilding of 20 steam locomotives, 100 automobile cars, and 886 box cars. Practically all of the new and a substantial part of the rebuilt units of equipment were completed and in service at the close of the year.

The note for $1,000,000 negotiated with The Railroad Credit Corporation in 1932 matured during the year, and was renewed in the sum of $612,022, it having been reduced to the latter amount by cash payments to The Railroad Credit Corporation of $63,385, and distributions by that Corporation to your Company of $324,593.

The loyal and efficient services rendered during the year by officers and employes are fully appreciated by the Management and are duly acknowledged.

By order of the Board of Managers.

J. M. DAVIS, President.

[Advertisement]

**VAPOR Products**

STEAM COUPLERS ARA Standard

VAPOR SYSTEM Thermostatic Control

FLEXIBLE CONDUITS In place of Steam Hose

CONTROLS for Air Conditioning

VAPOR CAR HEATING CO., Inc.
RAILWAY EXCHANGE, CHICAGO

**"Arctic" 36 BRONZE**
CAR JOURNAL BEARINGS

LONG WEAR

NO TROUBLE

NATIONAL BEARING METALS CORP.
ST. LOUIS, MO.

New York, N. Y.
Jersey City, N. J.
Pittsburgh, Pa.
Meadville, Pa.
Portsmouth, Va.
St. Paul, Minn.

2

THE BUCKEYE STEEL CASTINGS CO.
COLUMBUS, OHIO

MANUFACTURER of Side Frames and Bolsters for 4-Wheel and 6-Wheel Freight Cars and Locomotive Tenders, A. R. A. Couplers, Yokes and Car Castings.

**Pittsburgh Spring & Steel Co.**
1417 Farmers Bank Building, Pittsburgh, Pa.
Makers of Elliptic and Spiral SPRINGS of Every Description
Carbon, Vanadium, Silico-Manganese Steels.
Licensed manufacturers under patents for "Coil-Elliptic" groupings.
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New York 3723 Grand Central Terminal
Chicago 1405 Fisher Bldg.

EDGEWATER STEEL COMPANY
PITTSBURGH, PA.

Details of our products appeared in the following issues of *Railway Age* during 1933, 1934, 1935:

1933—Feb. 4, 25—March 4—April 1—May 6—June 3, 24—July 1, 22—Sept. 2—Oct. 7, 28—Nov. 4—Dec. 2.
1934—Jan. 6, 27—Feb. 17—March 3—April 7, 21—May 5, 19—June 2, 9, 16, 30—October 13—November 3—Dec. 1.
1935—January 5, 26—February 2, 16—March 16.


**For Complete Alphabetical Index to Advertisers see page 24**

## GET TOGETHER DEPARTMENT

### EDUCATIONAL

THE Railway Educational Bureau, Omaha, Neb., offers a distinctive education service for Supervisors and other employees. Write for FREE Special Bulletin.

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GAS ELEC.—Comb. Pass. Bag. & Mail—2 cars All-steel, modern, built 1926.
BAGGAGE CARS — ONE or MORE, 60 ft. wood body, steel underframe, 4-wheel steel trucks. Quick delivery.
OFFICE CAR—71 ft. 10 people, equipped. Very serviceable—bargain.
Iron & Steel Products, Inc.
Railway Exchange
Chicago, Ill.

### FOR SALE

Why apply
*NEW* cast steel Truck Side Frames to *OLD* Cars?
**BUY GOOD USED FRAMES**
Save 50%! *Two* Sets for *One!*
Iron & Steel Products, Inc.
*Frank Parker, Pres.*
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"SERVICE-Tested" Car Parts

Your classified advertisement should appear in this section

### POSITION OPEN

SALARIED POSITIONS $2,500 to $25,000—This thoroughly organized advertising service of 25 years' recognized standing and reputation carries on preliminary negotiations for positions of the caliber indicated, through a procedure individualized to each client's personal requirements. Several weeks are required to negotiate, and each individual must finance the moderate cost of his own campaign. Retaining fee protected by a refund provision as stipulated in our agreement. Identity is covered and, if employed, present position protected. If you have actually earned over $2,500, send only name and address for details.

R. W. BIXBY, Inc.
102 Delward Bldg., Buffalo, N. Y.

Take advantage of space in these columns


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*"Railway and Engineering Review"*

January-December, 1888, 1897, 1899, 1900, 1901, January-June and July-December, 1906. January-December, 1907, 1908, 1909. January-June and July-December, 1910. July-December, 1911; January-June and July-December, 1912 and 1913.

12 x 14 x 4 inches for the six months volumes, weight about 15 pounds. $4.00 for the six months volumes; $7.00 for annuals, postpaid.

*"Railway Age Gazette"*

July-December, 1910 and 1911. January-July and July-December volumes from 1912 to 1918 inclusive.

*"Railway Review"*

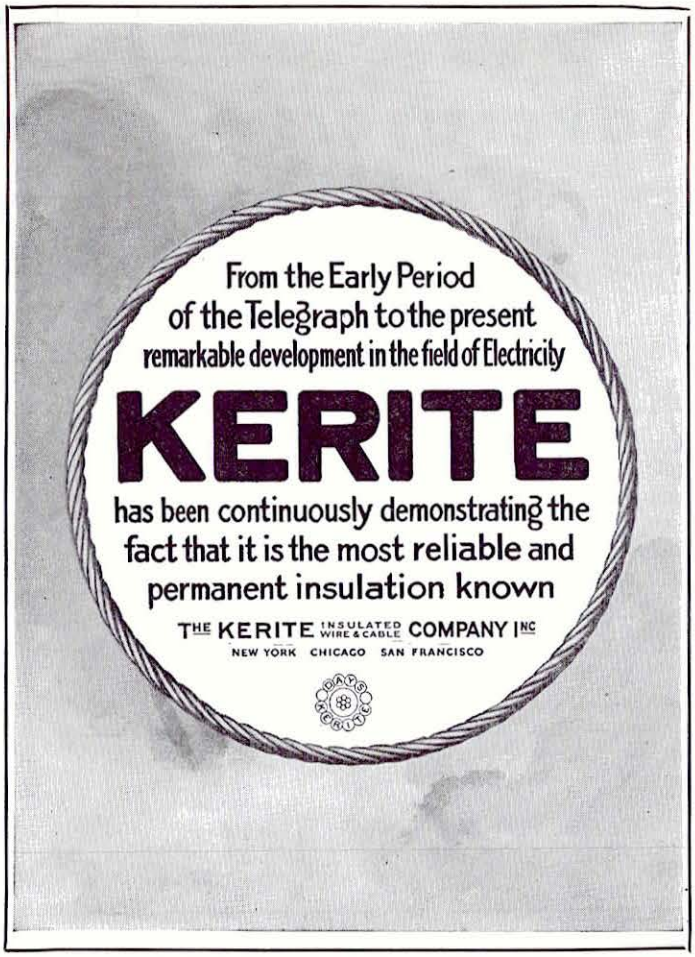
July-December, 1916; January-June and July-December, 1917; July-December, 1918; January-June and July-December from 1919 to 1922 inclusive.

*"Railway Age"*

July-December, 1918; January-June and July-December from 1919 to 1929 inclusive.

9 x 12 x 3 inches, weight about 5 pounds, buckram binding, $4.00, postpaid.

BOOK DEPARTMENT
**SIMMONS-BOARDMAN PUBLISHING CO.**
**30 Church Street New York**


From the Early Period
of the Telegraph to the present
remarkable development in the field of Electricity
KERITE
has been continuously demonstrating the
fact that it is the most reliable and
permanent insulation known
THE KERITE INSULATED WIRE & CABLE COMPANY INC
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*Lecturer in Mechanical Engineering, University of Liverpool*

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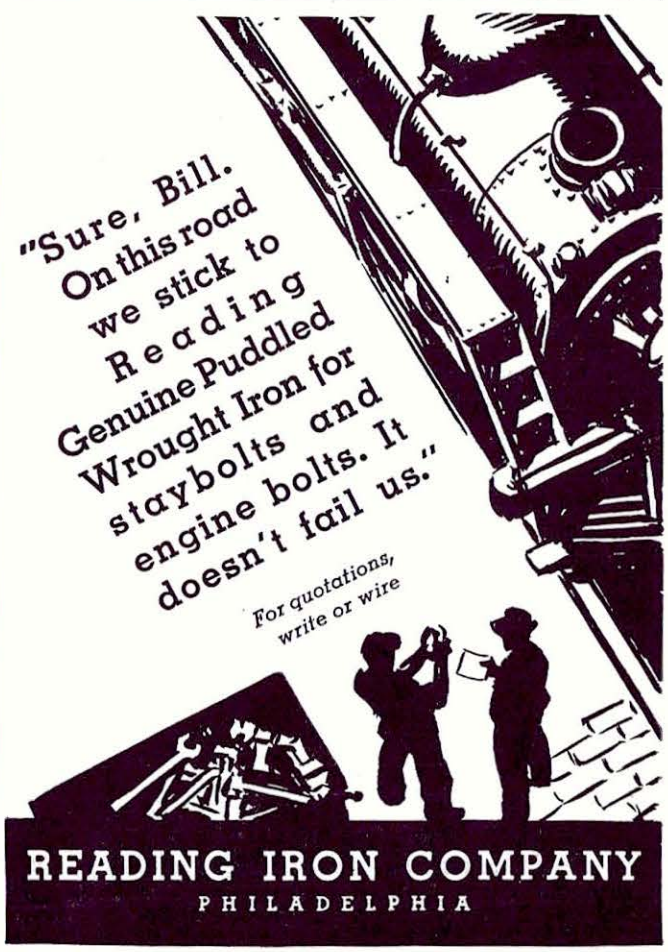


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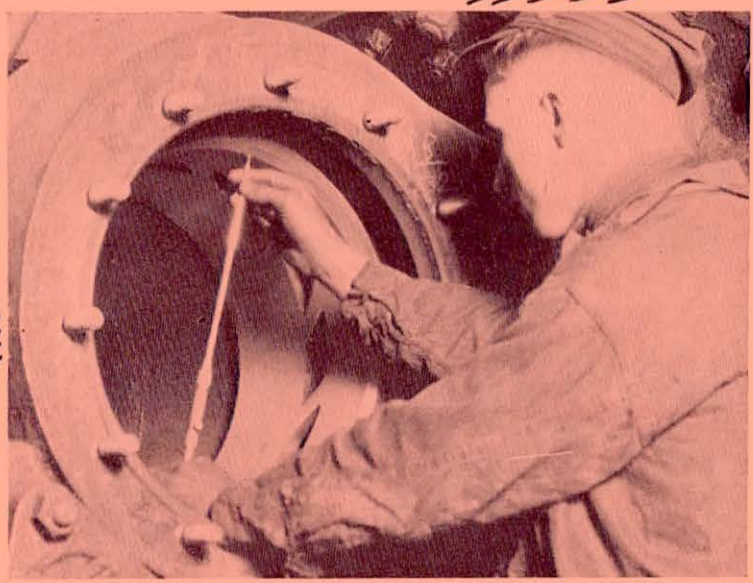

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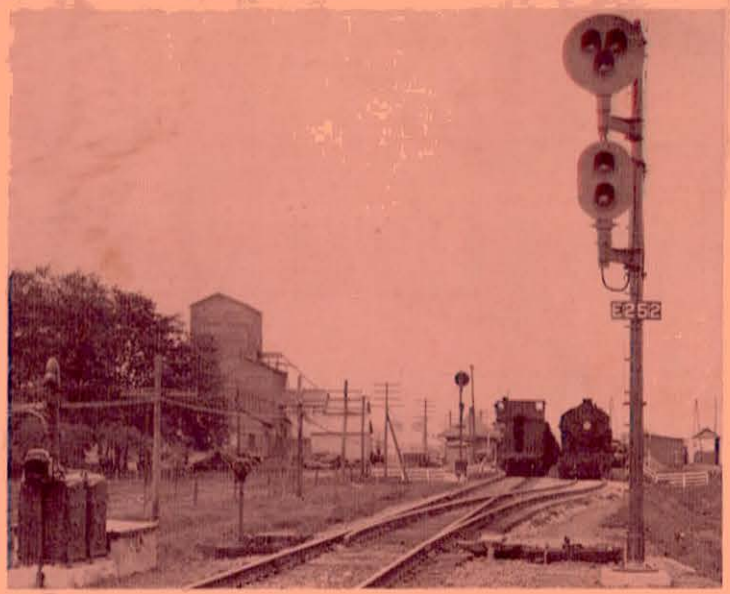
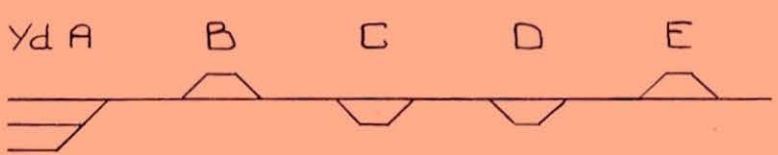


In 1927 one railroad installed centralized traffic control on a 43.5-mile section, including 36.9 miles of single track, with all tracks equipped for train operation by signal indication in either direction.

The following train movements, which occurred on a 21-mile section of this installation, show how traffic was expedited:

"A southbound fast freight, No. 97, with 41 loads and 1 empty, left Yard A at 5:10 A.M. At B, the first passing track south, this train met No. 41, a northbound passenger train. Number 97 was run through the siding but kept moving so that this was a non-stop meet. At C, the next passing siding, No. 97




held the main while No. 39, another northbound passenger train was running through the passing track, thus making a second non-stop meet. At D, the third station, No. 97 was run through the passing siding, while meeting northbound passenger train No. 37, thus completing a third non-stop meet. In addition, at E, No. 97 met engine 9742, making a fourth non-stop meet at successive passing sidings."*

* Railway Signaling, Vol. 24, p. 185.

UNION SWITCH & SIGNAL COMPANY
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## HISTORY IN THE MAKING

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